



21 May 2024

Markets Announcement Office
ASX Limited
Exchange Centre
20 Bridge Street
SYDNEY NSW 2000

Release of Supplementary Target's Statement

Metallica Minerals Limited ACN 076 696 092 (ASX: MLM) (**Metallica**) has today lodged with the Australian Securities and Investments Commission and sent to Diatreme Resources Limited ACN 061 267 061 (ASX: DRX) (**Diatreme**), a copy of its supplementary target's statement dated 21 May 2024 (**Supplementary Target's Statement**) in response to the unsolicited, off-market takeover from Diatreme.

In accordance with section 647(3)(b) of the *Corporations Act 2001* (Cth) (as inserted by ASIC Corporations (Replacement Bidder's and Target's Statements) Instrument 2023/688), a copy of the Supplementary Target's Statement is attached to this notice.

An electronic copy of the Supplementary Target's Statement and updates in relation to the Offer will be made available at <https://www.metallicaminerals.com.au/asx-announcements>. Metallica shareholders with any questions in relation to the Offer, or who wish to request a hard copy of the Target's Statement or the Supplementary Target's Statement, should contact admin@metallicaminerals.com.au.

Authorised for ASX release on behalf of the Board of Metallica.

For further information, please contact:

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**SUPPLEMENTARY TARGET'S
STATEMENT ISSUED BY
Metallica Minerals
Limited**

ACN: 076 696 092

in response to the takeover bid made by Diatrema Resources Limited
for all of the ordinary shares in Metallica Minerals Limited

**The Directors STILL unanimously
recommend that Metallica Shareholders**

REJECT

the Offer **by taking NO ACTION as it
materially undervalues your
Metallica Shares and has been held by the
independent expert to be NOT FAIR and
NOT REASONABLE**

This document contains important information and requires your immediate attention.
You should read this document in its entirety. If you are in any doubt as to how to deal with this document,
you should consult your legal, financial or other professional advisers as soon as possible.

Information about this Supplementary Target's Statement

Introduction and important notices

This document is a supplementary target's statement dated 21 May 2024 (**Supplementary Target's Statement**) and is issued by Metallica Minerals Limited (ACN 076 696 092) (**Metallica**) under section 644(1) of the *Corporations Act 2001* (Cth) (**Corporations Act**). This Supplementary Target's Statement supplements, and should be read together with, Metallica's Target Statement dated 24 April 2024 (**Original Target's Statement**). This Supplementary Target's Statement prevails to the extent of any inconsistency with the Original Target's Statement.

Unless the context requires otherwise, terms defined in this Supplementary Target's Statement have the same meaning given in section 11 of the Original Target's Statement. The rules of interpretation in section 11.2 of the Original Target's Statement also apply to this Supplementary Target's Statement.

A copy of this Supplementary Target's Statement was lodged with ASIC and given to the ASX on 21 May 2024. Neither ASIC, ASX nor any of their respective officers take any responsibility for the content of this Supplementary Target's Statement.

Forward looking statements

Some statements in this Supplementary Target's Statement are in the nature of forward-looking statements. You should be aware that these statements are predictions only and are subject to inherent risks and uncertainties. Those risks and uncertainties include factors and risks specific to Metallica as well as general economic conditions and conditions in the financial markets, exchange rates, interest rates and the regulatory environment, many of which are outside the control of Metallica and its Directors. Actual events or results may differ materially from the events or results expressed or implied in any forward-looking statement.

None of Metallica, any of its officers or any person named in this Supplementary Target's Statement with their consent or anyone involved in the preparation of this Supplementary Target's Statement makes any representation or warranty (either express or implied) as to the accuracy or likelihood of fulfilment of any forward looking statement or any events or results expressed or implied in any forward looking statement, except to the extent required by law. You are cautioned not to place undue reliance on those statements.

The forward-looking statements in this Target's Statement reflect views held only as at the date of this Supplementary Target's Statement.

New information

On 8 May 2024, Diatreme made an ASX announcement titled "*Diatreme's response to Metallica's Target's Statement – Diatreme reiterates that Metallica Shareholders should Accept its Offer*" (**DRX TS Response Announcement**). The DRX TS Response Announcement raised, in the opinion of the Diatreme directors, inaccuracies in the Original Target's Statement. By way of ASX Release dated 10 May 2024 and titled "*MLM response to DRX 3rd supplementary bidders statement*", your Metallica Directors responded to these alleged inaccuracies in detail (**MLM Response Announcement**). A copy of the MLM Response Announcement is attached as Annexure 1 of this Supplementary Target's Statement.

The DRX TS Response Announcement also attached a report by Grant Thornton (**GT Report**), which identified a number of concerns with the Independent Expert's Report (**Original Independent Expert's Report**). As noted in the MLM Response Announcement, the Independent Expert advised the Metallica Directors that it intended to consider each of

the points raised with the Original Independent Expert's Report and, to the extent that it considered necessary or appropriate, provide additional disclosure to Metallica Shareholders. The Independent Expert has now provided a revised Independent Expert's Report (**Revised Independent Expert's Report**) which is attached as Annexure 2 (as a clean version) and Annexure 3 (as a marked-up version). The marked-up version shows the amendments to the Original Target's Statement.

The amendments in the Revised Independent Expert's Report address a number of the concerns raised in the GT Report. In terms of those amendments most material to the valuation, the two key amendments that the Independent Expert has made in the Revised Independent Expert's Report is the removal of the 30% control premium in respect of the valuation of Metallica (on the basis that the DCF methodology adopted by the Independent Expert already assumes that the asset is controlled) and the addition of a 70% dilution discount to account for the risks and uncertainties of Metallica raising equity funding for mine construction. The Independent Expert's amendments on these two points has had a material change on the value of Metallica.

The value of Diatreme has also increased materially due to the addition of the Galalar Project.

To the extent that the revised valuation by the Independent Expert resulted in a change to information in the Original Target's Statement (primarily in sections 1 and 2 of the Original Target's Statement), the relevant parts of the Original Target's Statement have been restated in section 2 of this Supplementary Target's Statement.

Consents

As permitted by *ASIC Corporations (Takeover Bids) Instrument 2023/683 (ASIC Instrument 2023/683)*, this Supplementary Target's Statement contains statements that are made, or based on statements made, in documents lodged with ASIC or ASX (in compliance with the ASX Listing Rules). Pursuant to ASIC Instrument 2023/683, the consent of persons such statements are attributed to is not required for the inclusion of those statements in this Supplementary Target's Statement.

Any Metallica Shareholder who would like to receive a copy of any of the documents (or parts of the documents) that contain the statements which have been included pursuant to ASIC Instrument 2023/683 may obtain a copy (free of charge) during the Offer Period by contacting admin@metallicaminerals.com.au. The copy will be provided within two Business Days of the request.

As permitted by *Corporations Instrument 2016/72*, this Supplementary Target's Statement contains share price trading data sourced from MORNINGSTAR without its consent.

Standard information

To the extent necessary, the information listed on pages 2 and 3 of the Original Target's Statement continue to apply to this Supplementary Target's Statement.

Approval of Supplementary Target's Statement

This Supplementary Target's Statement has been approved by a resolution passed by the Metallica Directors. All Directors voted in favour of the resolution on 21 May 2024.

1 Executive Chairman's Letter

21 May 2024

Dear Fellow Shareholders,

OUR RECOMMENDATION REMAINS UNCHANGED - REJECT DIATREME'S OFFER FOR YOUR METALLICA SHARES AS YOUR BOARD INTENDS TO DO

As I noted in the Original Target's Statement, you would have received a Bidder's Statement from Diatreme Resources Limited (**Diatreme**) in relation to its unsolicited **conditional** offer to acquire all of your shares in Metallica Minerals Limited (**Metallica**) (**Offer**). Diatreme has since released two further supplementary bidder's statements (the **Second Supplementary Bidder's Statement** and the **Third Supplementary Bidder's Statement** respectively).

Diatreme is still offering 1.3319 fully paid ordinary shares in Diatreme as consideration for each of your Metallica Shares, valuing Metallica at \$24.3 million.¹

Your Directors have issued this Supplementary Target's Statement, primarily, to provide a copy of the Revised Independent Expert's Report (the circumstances of which the revisions to that report have occurred are set out in the "New information" section of page ii), but also to provide an update on the status of discussions with other parties regarding potential alternative transactions. Your Directors note that the Revised Independent Expert's Report has incorporated a number of changes that result in material changes to the valuation of both Metallica and Diatreme. Notwithstanding these revisions, Advisory Partner Connect Pty Ltd has still deemed the Offer to be **NOT FAIR AND NOT REASONABLE**. Metallica Shareholders should carefully review and consider the changes to the Revised Independent Expert's Report, which have been marked-up against the Original Independent Expert's Report in Annexure 3.

This Supplementary Target's Statement replaces those parts of section 2 of the Original Target's Statement which are now inaccurate as a result of the changed valuations of Metallica and Diatreme in the Revised Independent Expert's Report. Your Directors continue to recommend that you **REJECT** the unsolicited, inadequate and opportunistic Offer.

Your Directors note that the most material change to the Metallica valuation in the Revised Independent Expert's Report was the adjustment for equity dilution (see appendix E (Potential Dilution) – the Revised Independent Expert's Report). In particular, the Independent Expert chose to value Metallica on the basis of a DCF (discounted cash flow) methodology. Before Metallica can achieve the cash flows from the CFS Project, it would need to fund the CFS Project, so the valuation needs to consider the effect of debt and equity funding. The Original Independent Expert's Report addressed the debt funding requirement (\$100 million) and equity funding was incorporated into the WACC (weighted average cost of capital). The Independent Expert then changed that methodology to address equity funding dilution in the Revised Independent Expert's Report by assuming a 70% dilution discount to account for the equity funding requirement. In particular, the Independent Expert assumed that \$132.5 million of equity would be raised at a 3.3 cents per share (a 25% premium to the prevailing Metallica share price). The effect of this adjustment on the value of the CFS Project is a reduction of \$143 million. Your Directors note that there may be an opportunity to reduce the equity component of the capital raised to fund the development of the CFS Project (currently 43/57: debt/equity to, for example, a 50/50 ratio of

¹ Based on the closing price of Diatreme Shares on Monday, 20 May 2024 shortly before release of this Supplementary Target's Statement being \$0.019.

debt/equity). Your Directors are also hopeful that as Metallica achieves the approvals required for final investment decision (FID) in respect of the CFS Project, the Metallica share price would increase over time to reflect the reduced risks. Obviously, neither of those outcomes can be guaranteed, but given the potential effect of this adjustment on the valuation of Metallica, your Directors consider it appropriate to identify these potential mitigants.

Reasons why you should REJECT the Offer

Your Metallica Directors recommend that you join us in **REJECTING** the Offer because:

1. The Independent Expert remains of the view that the Offer is NOT FAIR AND NOT REASONABLE:

The Independent Expert has concluded that the Offer of 1.3319 fully paid ordinary shares in Diatreme for each of your Metallica Shares is **NOT FAIR AND NOT REASONABLE** and is below the Independent Expert's estimated fair value of 7.1 cents to 7.6 cents per Metallica Share.

Metallica Shareholders should review the Revised Independent Expert's Report in Annexure 2.

2. You should carefully consider the value of Diatreme Shares as consideration given the inherent project risk:

Section 3 of the Original Target's Statement sets out a number of concerns that your Directors have regarding Diatreme's Northern Silica Project. Your Directors recommend that you consider that section of the Original Target's Statement carefully.

The Revised Independent Expert's Report included a valuation for Diatreme's Galalar Silica Sand Project (Galalar Project) of \$28.45 million (mid-point valuation on an equity ownership basis). In the Revised Independent Expert's Report, the Independent Expert says: *"[a]lthough the Galalar Project has probable reserves, Diatreme has publicly announced that their efforts were to focus on developing the Northern Silica Project and therefore, have stopped developing the Galalar project. Moreover, in July 2023, Diatreme formally withdrew its application to prepare an EIS for Galalar."* Your Directors are aware that the Galalar Project, if ever developed, would require a 30km slurry pipeline that traverses rivers. For a number of years, Diatreme promoted the Galalar Project as its "flagship project". On 31 July 2023 Diatreme formally withdrew its application to prepare an EIS for the Galalar Project, essentially putting the project on hold. In Diatreme's quarterly report for the period ended 30 June 2023, it stated that: *"the [Galalar Project] EIS process has been put on hold. Recommencing this process will be reviewed after the [Northern Silica Project] has been granted its primary permitting and approvals and commenced export activities"*. The withdrawal of the EIS for the Galalar Project and subsequent consideration of a slurry pipeline to transport silica sand 30km would suggest that Diatreme acknowledges these issues and that, in the current construction and approval market, the Galalar Project is a challenged project.

For this reason, your Directors question the value of the Galalar Project, which has significant commercial and environmental challenges. With no current plans to seek environmental approval and a highly qualified commitment to the development of the project, it is not clear on what basis the reporting of Ore Reserves continues to be valid.

3. Based on the recent closing price of 1.90 cents per Diatreme Share, the Offer implies a value of 2.53 cents per Metallica Share, compared to a valuation by the Independent Expert of 7.1 cents to 7.6 cents:

Based on the Revised Independent Expert's valuation the Offer still contains no premium for control.

In light of the above, your Directors are still unanimous in their view that the Offer does not appropriately value the quality and future potential of Metallica's assets.

Status of discussions with third parties

Since the announcement of Diatreme's conditional intention to bid on 16 February 2024, your Directors have been working to identify parties who may have an interest in acquiring the CFS Project, with a view to identifying whether a superior proposal could be agreed. These efforts have resulted in three interested parties being given access to a dataroom that was established for the purpose of providing disclosure in relation to the CFS Project. Each of the parties is a foreign company with credible record of resource project development. Two of those parties have a record of resource project development in Australia. One of those parties made a cash non-binding indicative offer which the board of Metallica believed did not consider appropriately valued the CFS Project. Engagement with that party recently ceased after a period of negotiation, in an attempt to increase the cash price offered. Another party continues to conduct due diligence on Metallica. Whilst this party is yet to make a proposal, the party is aware of the Diatreme Bid and the associated timetable and, based on recent discussions between that party and Metallica, that party continues to express an interest in a potential offer for the CFS Project. Your Metallica Directors will keep the market informed of material developments in this regard as they arise.

Each of the Directors (all of whom hold Metallica Shares) intend to **REJECT** the Offer in respect of their own holding of Metallica Shares.

To REJECT the Offer, simply ignore all communications from Diatreme and do nothing.

I encourage you to read this Supplementary Target's Statement carefully. If you are in any doubt about how to deal with this document, please contact your broker, financial or legal adviser who is able to take account of your individual circumstances. Should you have any queries about the Offer or this Supplementary Target's Statement, you can contact Metallica by email on admin@metallicaminerals.com.au.

Yours sincerely,



Theo Psaros
Executive Chairman
Metallica Minerals Limited

2 Changes to disclosure in relation to Directors' Recommendation as a result of amendments to the Revised Independent Expert's Report

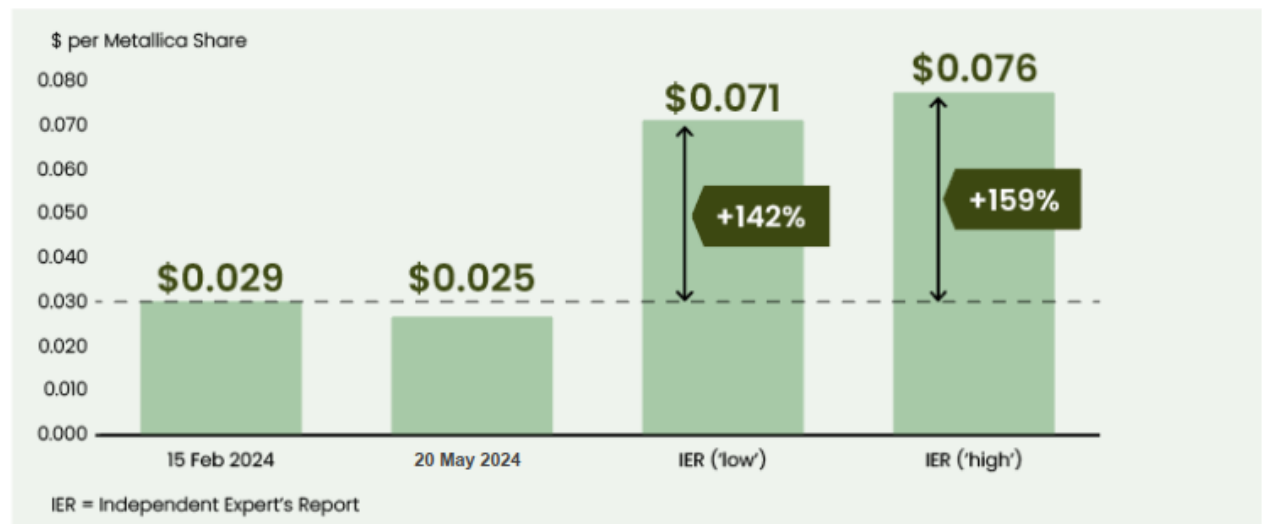
Your Directors still unanimously recommend that Shareholders **REJECT** the Offer. In addition to the key reasons listed to the REJECT the Offer that were outlined in section 2 of the Original Target's Statement that are not mentioned below:

2.1 The Independent Expert has concluded that the Offer is NOT FAIR and NOT REASONABLE

The key conclusions from the Independent Expert are that:

- The fair value of Metallica Shares on a control basis is between 7.1 cents per Share (at a 'low value') and 7.6 cents per Share (at a 'high value'), which corresponds to market capitalisations for Metallica of approximately \$70.01 million and \$75.06 million, respectively. The Offer only values Metallica at approximately \$24.3 million.²

Figure 1: Offer Consideration vs Independent Expert's value³



- The deemed fair value of the Merged Group on a minority basis is between 4.7 cents per Share (at a 'low value') and 5.6 cents per Share (at a 'high value'), which represents significant discounts of 34% and 25%, respectively, to the deemed fair value of Metallica Shares on a control basis.

The Revised Independent Expert's Report can be viewed in full in Annexure 2.

² Based on the closing price of Diatrema Shares on Monday, 20 May 2024 shortly before release of this Supplementary Target's Statement being \$0.019.

³ The Diatrema share price on 15 February 2024, being the closing price on the trading day before Diatrema announced an intention to make the takeover bid, was \$0.022 (closing), meaning that the Offer Consideration was at that time valued at \$0.029 per Metallica Share. The Diatrema share price on 20 May 2024 shortly before release of this Supplementary Target's Statement was \$0.019 (closing), meaning that the Offer Consideration was at that time valued at \$0.025 per Metallica Share. The bars labelled IER 'low' and IER 'high' are the Independent Expert's assessment of the fair value of Metallica Shares on a control basis (see page 3 of the Revised Independent Expert's Report). Trading data for this chart was sourced from MORNINGSTAR.

2.2 Metallica Shareholders do not receive their 'fair share' of the Merged Group

The Independent Expert has estimated Metallica's fair value as between \$70.1 million and \$75.06 million (on a controlling basis) whereas the fair value of the Merged Group is between \$236.99 million and \$285.26 million (on a minority basis). Accordingly, while Metallica's contribution to the value of the Merged Group is 27.78%, the Offer (if successful) would result in Metallica receiving 26.16% of the Merged Group.

These revised valuations in the Revised Independent Expert's Report no longer conclusively demonstrate the point previously made in the Original Target's Statement as to Metallica Shareholders not getting their "fair share". A key reason for this is the inclusion of \$28.45 million value for Diatreme's Galalar Project (mid-point valuation on an equity ownership basis), which Metallica comments on in section 1 (Executive Chairman's Letter) of this Supplementary Target's Statement.⁴

Your Directors re-iterate the various issues raised with Diatreme's existing projects (namely its flagship Northern Silica Project). Those issues in respect of Diatreme's existing projects were raised in section 3 of the Original Target's Statement. Diatreme did not dispute many of the critical issues that Metallica raised in the DRX TS Response Announcement (nor has Diatreme addressed these issues elsewhere).

The above analysis in this section 2.2 also applies to figure 8 of the Original Target's Statement.⁵

2.3 Based on the recent closing price of 1.90 cents per Diatreme Share, the Offer implies a value of 2.53 cents per Metallica Share, compared to a valuation by the Independent Expert of 7.1 cents to 7.6 cents.

Based on the Independent Expert's valuation, the Offer contains no premium for control, merges Metallica with a company whose flagship project is only at scoping study stage and does not materially affect the largest shareholders of each entity, yet Diatreme intends to exert control over both the management and board of the Merged Group if the Offer is successful.⁶ Refer to section 2.5 of the Original Target's Statement for further information here.

⁴ This is relevant for figures 3 and 4 of the Original Target's Statement, both of which are now withdrawn.

⁵ Figure 8 of the Original Target's Statement is withdrawn.

⁶ As per section 8.2.3 on page 58 of the Bidder's Statement, it is Diatreme's intention to replace all Metallica Directors and it is uncertain which (if any) of Metallica's current Management team will be retained.

Annexure 1 – MLM Response Announcement



10 May 2024

Metallica's response to Diatreme's third supplementary bidder's statement

On 8 May 2024, Diatreme Resources Limited (ASX: DRX, Diatreme) announced: "*Diatreme's response to Metallica's Target's Statement*", which purported to identify a number of '*inaccuracies and clarification (sic)*' in respect of Metallica's target's statement. Metallica has responded to each of the points raised by Diatreme in the table below.^{1 2} The Diatreme announcement also criticised the independent expert report that accompanied Metallica's Target's Statement, by way of a report prepared by Grant Thornton, which was also attached to the Diatreme announcement.

The board of Metallica notes that the Grant Thornton report contained a warning that "*[the report] must not be used by [Metallica shareholders] in their decision of whether or not to accept the Offer*", which is inconsistent with the inclusion of the report in the supplementary bidder's statement. It is not clear how Grant Thornton intends for their report to be used by Metallica shareholders.

Regardless, the independent expert has advised the Metallica board that it intends to consider each of the points raised and, to the extent that it considers necessary or appropriate, provide additional disclosure to Metallica shareholders. To the extent that any such disclosure results in a change to information that the Metallica board referred to in the target's statement (primarily in sections 1 and 2), it is the Metallica board's intention to restate the relevant parts of the target's statement to ensure that any revised disclosure is clear, concise and effective for Metallica shareholders.

In the meantime, the Metallica Board continues to recommend that shareholders REJECT the Offer.

Metallica has responded to each of the points raised by Diatreme in respect of Metallica's target's statement in the following table:

¹ The table includes a number of items that relate to the PAEMAC Report, which was a report commissioned by the independent expert. The PAEMAC Report was prepared by PAEMAC (<http://paemac.com>), a highly respected engineering firm specialising in marine engineering projects. While PAEMAC itself is best placed to respond to Diatreme's comments, Metallica has, where appropriate, sought to provide some comment on the relevant disclosure.

² Capitalised terms used (but not defined) in this announcement have the meaning given in the Target's Statement.

Extract from Diatreme's third supplementary bidder's statement

Metallica's response

Clarification: Metallica indicates that it is more advanced than Diatreme

Diatreme acknowledges Metallica has completed a later stage study than Diatreme, being a definitive feasibility study while Diatreme has completed a scoping study. However, the key timing constraint to development of both Diatreme's and Metallica's projects is the approvals process, with the principal one being the EIS process. Both Metallica and Diatreme are at the beginning of the EIS terms of reference phase, within the project approvals process. The project timetable for both companies is to make a Final Investment Decision (FID) in approximately mid-2025. Diatreme notes Metallica previously experienced significant challenges with their initial project approval process, being unsuccessful in securing a site-specific Environmental Authority. The CFS was subsequently deemed by the Federal Government to be a controlled action requiring an EIS.

Metallica has completed TWO further studies beyond Diatreme's scoping study, providing a notably higher level of certainty with each successive study. The Pre-Feasibility (Class 4 AACEi) and Definitive Study (Class 3 AACEi) each took between 9 and 12 months to complete, putting Diatreme anywhere between 18 and 24 months behind Metallica on engineering and feasibility alone.

Other key reasons why your Directors consider it highly unlikely that Diatreme will progress to FID in mid-2025 are:

- Diatreme is unable to identify a single compelling export solution, opting instead to put forward multiple 'potential' solutions. Diatreme's export solutions continue to evolve - as recently as Diatreme's most recent quarterly activity report (lodged with ASX on 29 April 2024), Diatreme has identified yet another 'potential' solution (involving the construction of mooring dolphins). In short, Diatreme has no certainty that any of the 'export solutions' it is considering are viable.
- Diatreme's project area is significantly larger than Metallica's project, including High Environmentally Sensitive wetlands, and will require considerably more EIS investigative work, and correspondingly more resources, including funding. Based on historical timeframes for other Queensland projects Metallica expects Diatreme's Northern Silica Project EIS to take at least 2 years from commencement.
- Water licences require a minimum of 2 years of monitoring data. Diatreme installed water bores in late 2023 to early 2024. Accordingly, the critical historical data required to apply for the necessary water licences won't be sufficient until late 2025. The subsequent groundwater modelling, reporting and application process with Department of Regional Development, Manufacturing and Water (DRDMW) will take another 12 months.

Your Directors caution Metallica shareholders from placing reliance on Diatreme's forecast timelines. Metallica believes that the earliest that Diatreme will complete the EIS will be 2026, and therefore their first shipment in late 2026 is not achievable unless the Diatreme board and funders are willing to proceed past FID without many of the customary approvals and appropriate levels of engineering in place.

Statement: No tugs at Cape Flattery Port, which impacts Diatreme's proposed phase 2 extension

Tugs were introduced to Cape Flattery Port in 2023, which is recognised in the Target's Statement as a mitigation on simultaneous interaction between phase 2 construction and CFSM vessels.

Metallica notes that the statements regarding the availability of tugs at Cape Flattery Port were extracted from the PAEMAC Report, commissioned by the Independent Expert. The PAEMAC Report was prepared by PAEMAC (<http://paemac.com>), a highly and respected engineering firm specialising in marine engineering projects. While PAEMAC itself is best placed to respond to Diatreme's comments, Metallica makes the following observations:

- Metallica is aware that Mitsubishi owns and operates two tugs.
- Mitsubishi has no commercial obligation to allow those tugs to be used by other parties in the port.

The IER's reference in Table 43 (Port Infrastructure Interaction Issues) regarding tugs is therefore also inaccurate.	• Diatreme's Scoping Study does not appear to make any capital allowance for tugs, other than tugs required to operate the transshipping barges. • Therefore, Metallica considers that the risk identified in the PAEMAC Report i.e. that there are no tugs available for Diatreme to use at Cape Flattery, is an appropriate risk for PAEMAC to have identified.
<u>Clarification: CFSM cannot be compelled to co-operate on vessel scheduling</u> Priority rights will form part of the essential terms of any partial facility user agreement, which is negotiated directly with Ports North. CFSM will be required to adhere to the Port of Cape Flattery port rules which include the movement of ships and which are set by Ports North acting as the port authority and the harbour master.	Mitsubishi will have priority rights for use of the port facilities should a part user facility agreement be entered into between Diatreme and Mitsubishi. The "Essential User Terms", which must be contained in any part user facility agreement, include: <i>"an obligation on the part of the Facility User [Diatreme] to concede priority rights for use of the Facility (including the Sublessor's Property) to the Sublessee [Mitsubishi]"</i>. Clearly, the movement of ships under the port rules are day-to-day operational matters which, for safety reasons (among others), Ports North acting as the port authority and harbour master will have the ability to control. However, as the sublessor under the relevant sublease, Ports North is still bound by the terms of the sublease which grants priority rights to Mitsubishi. As referenced in the Target's Statement, Mitsubishi has no obligation to schedule vessels in such a way to avoid times where Diatreme also has a vessel arriving at the port.
<u>Clarification and inaccurate statement: Use of cape size vessels by Metallica to transport silica and freight rate differentials</u> Diatreme, based on its own interactions and understanding of the market, is not aware of any significant PV grade silica off-takers in major Chinese markets that currently accept cape size vessel shipments. Diatreme considers Metallica's freight rate differential calculations are inaccurate as they fail to consider the significant demurrage costs associated with the indicated loading rate using cape size vessels. Current cape size vessels daily demurrage costs are estimated by Diatreme's Directors at US\$28,000 per day, which would add considerable costs on a per tonne basis for delivery to Asian markets that is not currently included in Metallica's calculations.	Metallica is aware of regular cape size shipments (~170,000 tonnes) of silica sand from Indonesia to China over the past 12 months. Silica sand "off-takers" in China for Cape Flattery product will be a mix of processors (for blending), traders and end-users. These parties will not be required to accept a full cape sized shipment of silica sand, but anything from a hold to multiple full holds of a cape size shipment – this practice is known as parceling in the shipping industry. Metallica has discussed parceling of cape size vessels with large off-takers and there is interest in receiving Australian silica sand in this way. As seaborne trade increases, cape sized shipments will become more common as will parceling. This is a common practice in other dry bulk commodities. Given its commentary, it is possible that Diatreme is not aware of such a practice. In terms of the suggestion that the freight rate differentials are inaccurate, section 3.2 of the Target's Statement addressed freight differentials, whereas Diatreme challenges demurrage rates. In relation to demurrage rates, Metallica agrees that usually (not always) demurrage rates on a cape sized vessel will be higher than supramax rates. Diatreme quoted a current demurrage rate of US\$28,000/day for a cape size vessel. Metallica's view is that demurrage rate for a supramax is approximately \$US18,000/day (using a loading rate of 10,000 tonnes per day). The US\$10,000/day higher demurrage rate on a cape size vessel equates to less than US\$0.06/tonne per day. Due to the much larger cargo on the cape size vessel, the higher demurrage rate is immaterial in comparison to the freight saving and revenue increase achieved on the cape sized vessel compared to a supramax. Metallica's calculations in the Target's Statement was relatively conservative by assuming only 50% of tonnage was shipped in cape size vessels, and that the full value of the upside was not captured.

Inaccurate statement: PAEMAC estimate of Diatreme's marine infrastructure capital cost

Diatreme considers the PAEMAC Report contains significant errors in calculating the capital cost of Diatreme's proposed marine infrastructure, as follows:

PAEMAC has assumed there will only be a 4WD track to the barge ramp for construction activities. Diatreme's scoping study includes construction of a road suitable for transporting marine infrastructure materials to the port. This incorrect assumption results in excessive and incorrect contractor preliminary costs as calculated by PAEMAC.

Metallica notes that the statements regarding the capital costs for Diatreme's project were extracted from the PAEMAC Report, commissioned by the Independent Expert. The PAEMAC Report was prepared by PAEMAC (<http://paemac.com>), a highly and respected engineering firm specialising in marine engineering projects. While PAEMAC itself is best placed to respond to Diatreme's comments, Metallica makes the following observations:

Your Directors believe it is unlikely a road, as contemplated in the Diatreme Scoping Study, will be constructed in reasonable time, perhaps if at all due to approvals and cost, and believe PAEMAC's approach to be reasonable and cost effective based on the following:

- Diatreme's intended road is over 32kms long (from the nearest sealed road to the proposed port location) – see Figure 1 below. The entire road will need to be completed before it can be used to transport marine infrastructure materials to the port, therefore the construction of port infrastructure becomes dependent on the ontime completion of the road. In Metallica's view this is a significant risk given the difficulties that will be encountered in the construction of this road. In addition to very difficult road building conditions, complexity is compounded by the annual flooding that occurs in this area due to the wet season.

Figure 1: Diatreme's intended road location



- PAEMAC has adopted a logical and common practice in industry which is to de-couple the marine infrastructure build from the civil construction build to derisk its on-time completion. Large marine infrastructure items such as piles exceed road size limits and are better transported by sea from a risk and cost perspective. Transport by road as contemplated by Diatreme introduces significant risk and additional cost through double handling and traffic interactions.
- With respect to the road Diatreme plans to build, as a comparison, the Peninsula Development Road in Cape York has been surfaced at an average of 22km of existing gravel road per annum since 2014. This is on a well serviced and connected highway, that already has an existing gravel base. The proposed Diatreme route for the Northern Silica Project is through sensitive sandy marsh lands and swamps with 'high environmental value'. A road through these regions would be slower to construct whilst causing disruption to natural surface water flow and ecosystems. It is not unreasonable to estimate that this road will take over 2 years to build. Metallica notes Mitsubishi has been operating in the area for over 50 years and brings in all large items by sea similar to the methodology adopted by PAEMEC.

PAEMAC has assumed contractors would have to construct their own camp at the port and that access to the site would only be by helicopter or landing craft. This is incorrect. Diatreme's scoping study includes construction of a camp at the mine site which is 15 minutes by road from the port. The camp at the mine site will be used by contractors for construction of the road and port infrastructure. This incorrect assumption results in excessive and incorrect contractor preliminary costs as calculated by PAEMAC.	• Whether or not the camp is built at the port or at the mine is immaterial since there still exists a need to accommodate marine construction workers. PAEMEC's report merely allocates the cost to where it is incurred. • Having workers at the mine camp introduces dependency on the road being complete, which compounds the risk of project delay. Without a complete all weather access road, moving between the wharf area and the proposed camp, and getting access to the entire project area will be extremely difficult during the wet season, resulting in delays and potentially cost blow-outs. • Fly-in fly-out is an accepted practice for a construction project such as Diatreme's, and is the approach adopted by Mitsubishi for its existing operation next door which has been operating in the area for over 50 years.
PAEMAC has assumed Diatreme's scoping study capital cost estimate for "offsite infrastructure" is the total capital cost estimate for comparison with the PAEMAC Phase 1 "Ramp + Transshipment" cost estimate. This is incorrect. The A\$78.3 million noted in Table 1.5 of Diatreme's scoping study is direct costs only and excludes indirect cost, owners' costs and contingency.	• Whether the indirect and contingency costs are accounted for in the off-site infrastructure or not, there will still be a requirement by Diatreme to cover these costs. That said, even after deducting the Engineering and Contingency costs from the PAEMAC Report, the PAEMAC calculations for capital costs are \$119.5m for Phase 1 and \$175.8m for Phase 2. Together, these costs are still 67.8% higher than the Off-Site Infrastructure Costs assumed in the Diatreme Scoping Study. • Furthermore, it is likely that "Off-site infrastructure" expenses includes other components outside of marine infrastructure e.g. roads, off site facilities etc. Despite this lack of transparency, it is clear by the title that the allocation of funds for marine infrastructure is less than the total figure arrived at for this category. This makes the estimated allocation for marine infrastructure even less adequate.
<u>Clarification: Diatreme's Non-Executive Director Michael Chapman is a nominee of Ilwella</u> Mr Chapman is not, and was not appointed as, a 'nominee' of Ilwella. Mr Chapman is an independent Non-Executive Director of Diatreme.	In Diatreme's notice of extraordinary general meeting dated 26 July 2022, paragraph 2.3(b) said: <i>"At the date of this Notice, Ilwella Pty Ltd had a shareholding in the Company of 17.05%. Listing Rule 10.11.3 applies to Ilwella Pty Ltd, as it is a person who is a substantial (10%+) holder in the Company and who has nominated a director to the board of the Company (Mr Michael Chapman) pursuant to a relevant agreement between Ilwella Pty Ltd and the Company which gives Ilwella Pty Ltd the right or expectation to do so."</i> The disclosure was made in relation to a placement by Diatreme to Ilwella Pty Ltd (following on from the placement to Sibelco Asia Pacific Pty Ltd). Mr Chapman abstained from making a recommendation in respect of the resolution to approve the placement.

What is more telling for Metallica's shareholders are the omissions from Diatreme's table of 'inaccuracies and clarification (sic)'. These omissions suggest that Diatreme accepts the significant project risks for the Northern Silica Project as outlined below (and set out in section 3 of Metallica's Target's Statement), including:

- Diatreme's Northern Silica Project faces significant challenges securing an export solution using existing infrastructure. Diatreme's public disclosure does not articulate the complexity and likely extended timeline of attempting to obtain access to existing infrastructure.

Even more concerning is that Diatreme does not seem to understand the legal requirements that underpin some of the export solutions it is pursuing. The Diatreme Bidder's Statement explicitly states that the partial user agreement "...does not require negotiation with [Mitsubishi]". The Diatreme March 2024 Quarterly Report now states that for Diatreme to secure "Full use of existing infrastructure" that "This option would be subject to a user agreement (including all commercial terms) being agreed with [Mitsubishi] and Ports North."

- Diatreme's Northern Silica Project faces a number of environmental considerations that have potential to impact the value and delivery of the Northern Silica Project.

Refer to section 3.6 of the Target's Statement.

- The Bidder's Statement makes various statements regarding the potential for synergies through the combination of Metallica and Diatreme, from an operational perspective, without providing any detail on those synergies.

Further, the Bidder's Statement lacks any cogent detail on Diatreme's intentions for the CFS Project. In essence, the disclosure says little more than that Diatreme will undertake a detailed review of Metallica before making any decisions. It is implausible that Diatreme has made a takeover bid for Metallica without a view on its intentions for the CFS Project, even if the view was subject to a further review. However, Diatreme's disclosure suggest that it has no intentions in respect of the CFS Project, and won't have any such intentions until it has conducted an operations review.

Diatreme's inability to articulate any operational synergies (at a project level) and the absence of any intentions with respect to Metallica might support a view that the acquisition of Metallica by Diatreme is a defensive move by Diatreme – in particular, Metallica exporting before Diatreme would represent a material risk to the viability of Diatreme's project.

Metallica is NOT running out of cash – with the Diatreme bid on foot, there are legal impediments to Metallica raising capital (on the basis that doing so would constitute a frustrating action).

In the course of discussions with parties prior to and following Diatreme's intention to make a bid, Metallica has identified prospective investors (who expressed interest in providing funding). If the Diatreme bid lapses, is withdrawn or continues to languish for an extended period, your Directors would resume discussions with those parties (and seek new targets) to ensure Metallica is appropriately funded.

Diatreme's Offer does NOT represent an attractive premium on your Metallica Shares – with Diatreme shares closing at 1.80 – 1.90 cents recently, the Offer implies a value of 2.40 – 2.53 cents per Metallica Share. Metallica's closing price in recent days has been 2.30 – 2.40 cents. Metallica's VWAP for the last 30 days is 2.30 cents and for the last 7 days is 2.30 cents. Any suggestion that this is an attractive premium is completely baseless.

Don't give up your ability to accept a superior proposal – Diatreme's disclosure suggests that, because no superior proposal has been made, there is no superior proposal coming. Metallica confirms that it is in discussions with other parties regarding potential alternative transactions. It is too early to provide any details on those discussions. If you accept the Diatreme Offer, you will likely be unable to participate in any superior proposal (should one emerge). Your Directors urge you to 'wait and see'. Your Directors expect that Diatreme will make an announcement to extend the bid by at least one month on or before 17 May 2024.

Metallica intends to provide this announcement as an annexure to a supplementary target's statement that will also address any amendments proposed by the independent expert.

This announcement has been approved by the Board. For further information, please contact:

Mr Theo Psaros
Executive Chairman
+61 (7) 3249 3000

Mr Scott Waddell
CFO & Company Secretary
+61 (7) 3249 3000

Forward-looking statements

Forward-looking statements are based on assumptions regarding Metallica, business strategies, plans and objectives of the Company for future operations and development and the environment in which Metallica may operate.

Forward-looking statements are based on current views, expectations and beliefs as at the date they are expressed and which are subject to various risks and uncertainties. Actual results, performance or achievements of Metallica could be materially different from those expressed in, or implied by, these forward-looking statements. The forward-looking statements contained in this presentation are not guarantees or assurances of future performance and involve known and unknown risks, uncertainties and other factors, many of which are beyond the control of Metallica, which may cause the actual results, performance or achievements of Metallica to differ materially from those expressed or implied by the forward-looking statements. For example, the factors that are likely to affect the results of Metallica include general economic conditions in Australia and globally; ability for Metallica to fund its activities; exchange rates; production levels or rates; demand for Metallica's products, competition in the markets in which Metallica does and will operate; and the inherent regulatory risks in the businesses of Metallica. Given these uncertainties, readers are cautioned to not place undue reliance on such forward-looking statements.

Annexure 2 – Revised Independent Expert's Report (Clean)



Metallica Minerals
Independent Expert's Report
21 May 2024

Financial Services Guide

About us

Advisory Partner Connect Pty Ltd (**"Advisory Partner"**) a Corporate Authorised Representative of AP Lloyds Pty Ltd ACN 643 090 359 Australian Financial Services Licence (**"AFSL"**) 526061 has been engaged by Metallica Minerals Limited (ASX:MLM) (**"Metallica"**) or (**"the Company"**) to provide financial product advice in the form of an independent expert report (**"the Report"**) to express our opinion whether the offer is fair and reasonable (**"Offer"**). Our Report sets out our opinion as to the Fair Market Value of the shares in Metallica. The Corporations Act 2001 (Cth) requires us to provide this Financial Services Guide (**"FSG"**) in connection with the attached Report prepared for Metallica. You are not the party who engaged us to prepare this Report and we are not acting for any person other than Metallica. This FSG provides important information designed to assist Shareholders in forming their views of the Offer and in understanding any general financial advice provided by Advisory Partner in this Report. Our Report is not intended to comprise personal retail financial product advice to retail investors or market-related advice to retail investors. This FSG contains information about our engagement by the directors of Metallica to prepare this Report in connection with the Offer, the financial services we are authorised to provide, the remuneration we (and any other relevant parties) may receive in connection with the Engagement, and details of our internal and external dispute resolution systems and how these may be accessed.

Financial services we are authorised to provide

Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd, the holder of Australian Financial Services Licence number 526061, is responsible to you for the services provided under this FSG. As a Corporate Authorised Representative the Australian Financial Services Licence authorises us to provide the following services to both retail and wholesale clients, financial product advice in relation to securities, fixed income and derivatives.

General financial product advice

This Report contains only general financial product advice. It was prepared without taking into account your personal objectives, financial situation or needs. Where the advice relates to the application for or acquisition of a financial product, you should also obtain and read carefully the relevant offer document or explanatory memorandum provided by the issuer or seller of the financial product before making a decision regarding the application for or acquisition of the financial product.

Remuneration, commissions and other benefits

Advisory Partner charges fees for its services and will receive a fee of \$55,000 to \$65,000 (excluding GST) for its work on this Report. These fees have been agreed on, and will be paid solely by Metallica, which has engaged our services for the purpose of providing this Report. Advisory Partner may seek reimbursement of any out-of-pocket expenses incurred in providing these services. Our advisers are directors and employees of Advisory Partner who are paid salaries and dividends by Advisory Partner and may also receive bonuses and other benefits from Advisory Partner. Our advisers may alternatively be paid by means of commission determined by a percentage of revenue written by the adviser.

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Risks associated with our advice

This Advisory Partner advice is provided in connection with the attached Report relating to the Offer. The Report comprises general product advice and does not comprise personal retail financial product advice to retail investors or market-related advice to retail investors. The Report is an expression of Advisory Partner's opinion as to whether the Offer is fair and reasonable. However, Advisory Partner's opinion should not be construed as a recommendation as to whether or not to approve the Proposed Transaction. Approval or rejection of the Offer is a matter for individual Shareholders based on their own circumstances, including risk profile, liquidity preference, investment strategy, portfolio structure, and tax position. Shareholders who are in any doubt as to the action they should take in relation to the Offer should consult their own independent professional advisers. Further information on the risks, assumptions and qualifications associated with the advice is contained within the Report.

Compensation arrangements

The law requires Advisory Partner to have arrangements in place to compensate certain persons for loss or damage they suffer from certain breaches of the Corporations Act by Advisory Partner or its representatives. Advisory Partner has internal compensation arrangements as well as professional indemnity insurance that satisfy these requirements.

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Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd, they are required to have an internal complaints-handling mechanism. All complaints can be addressed to us at Level 18, 324 Queen St, Brisbane QLD 4000. You may contact us on T +61 7 3106 3399 or F +61 7 3054 0438, E: admin@advisorypartner.com.au. If AP Lloyds Pty Ltd are not able to resolve your complaint to your satisfaction within 30 days of first lodging it with them, you are entitled to have your matter referred to the Australian Financial Complaints Authority (AFCA). You will not be charged for using the AFCA service. To contact the AFCA: Tel: 1800 931 678 or make a complaint at <https://www.afca.org.au/make-a-complaint>.

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21 May 2024

The Directors
Metallica Minerals Limited
Level 1, North Tower
527 Gregory Terrace
Fortitude Valley QLD 4006

Dear Sirs

INDEPENDENT EXPERT'S REPORT – OFFER TO PURCHASE OF METALLICA MINERALS LIMITED BY DIATREME RESOURCES

Introduction

The directors of Metallica Minerals (ASX: MLM) ("**Metallica**" or the "**Company**") have requested Advisory Partner Connect Pty Ltd ("**Advisory Partner**") to prepare an Independent Expert Report ("**IER**") to the unrelated shareholders of MLM (the "**Shareholders**"), setting out our opinion as to whether the offer by Diatreme Resources (ASX:DRX) ("**Diatreme**"), is fair and reasonable.

The offer is to purchase shares in Metallica funded via Diatreme shares, Metallica shareholders will receive 1.3319 fully paid ordinary shares in Diatreme for every one (1) ordinary share in Metallica on the record date (the "**Offer**" or "**Transaction**").

There is a minimum acceptance condition of 50.1%.

Metallica has engaged Advisory Partner to provide an Independent Expert Report (the "**Report**" or "**IER**"), which will be provided to the Shareholders, to assist the Directors of Metallica in providing the Shareholders with sufficient information to make their decision as to whether to accept the offer or not.

Summary Opinion

In our opinion, the Offer is not fair and not reasonable for the Shareholders of Metallica.

Fairness

In forming our opinion as to the fairness of the Offer, we have valued each component of the proposal being the fair market value of a Metallica share relative to the scrip offer provided by Diatreme.

Table 1: Fair Value

Fair Value	Low Value	High Value
Fair Value of Metallica share on a controlling basis	0.071	0.076
Fair Value of combined entity post-transaction (minority basis)	0.047	0.056
Premium / (Discount)	-34%	-25%

Source: AP Analysis

Advisory Partner assessed the fair market value of Metallica shares, on a control basis, is between **\$0.071 and \$0.076 per share**. By comparison, the assessed value of the combined entity on a minority basis is \$0.047 to \$0.056 per share. As demonstrated above, the value of the combined entity per share is lower than the assessed value of a Metallica share and as a result, the Offer is considered not fair for Metallica Shareholders.

We cannot predict the trading price of Metallica Minerals in the future, we have allowed for dilution to Metallica Shareholders to raise capital to fund the CFSS project. We cannot predict the trading price of Metallica Minerals and it is likely as the company reaches milestones developing the CFSS Project the share price will increase. As such, we have applied a 70% dilution to the value of CFSS to account for potential future dilutionary effects to fund the project. While the project has reached a Definitive Feasibility Stage there are company specific risks that exist. We consider that calculating a dilution at the current market price allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.

Reasonableness

We deem the offer to be not reasonable to shareholders of Metallica as we consider the disadvantages to outweigh the advantages of the offer. To assist the Shareholders in their decision-making process we have summarized the following:

- The likely advantages and disadvantages associated with the Offer; and
- Alternatives, including the position of Shareholders if the Offer does not proceed.

Shareholders of Metallica should read the full Report, where matters relevant to shareholders are explained in more detail.

Advantages of Approving the Offer

Set out below is a summary of the key advantages to the Shareholders of accepting the Offer.

- **Liquidity of shares**
Metallica shareholders currently face illiquidity in the trading of their shares. On a typical trading day, Metallica shares are thinly traded and have a wide bid-ask spread. As a result, it is difficult to sell shares in Metallica. The transaction may improve liquidity in the shares of the combined entity by increasing the market capitalisation and outstanding share count.
- **Economies of Scale**
The combined entity may provide operational improvements for the mines as both companies hold an interest in mines within the same vicinity.

Disadvantages

- **Dilution of Shares**
As both companies have projects which are pre-development, shareholders are at risk of future capital raisings which may dilute minority shareholders. The non-associated shareholders (excludes common shareholders) of Metallica Minerals and Diatreme Resources account for 49.87% of total shares in Metallica Minerals. This takeover offer sees that decrease to 12.73% of total shares in Diatreme. Diatreme's projects hold 513 Mt of resources, while Metallica holds 47 Mt of reserves at their CFS project according to the feasibility study. As such, Diatreme will require substantial efforts to acquire funding for the projects relative to Metallica, which are likely to be through the issuance of new ordinary shares.
- **Diatreme Funding Risk and Dilution**
If Diatreme successfully acquires Metallica Minerals, the company will be required to raise capital to fund the CFSS Project. This will further dilute the non-common Metallica shareholders who will already represent a minority interest in Diatreme (as stated in the above dot point). Our valuation of Metallica accounts for the dilution discount applied to the CFSS Project as outlined in Section 6.5 and Appendix G. The post-transaction valuation accounts for the dilutive discount of CFSS and the dilutive impact of the consideration. As set out in the post-transaction valuation, the value of the entity, including Diatreme, does not outweigh the value of Metallica.
- **Voting Power**
Diatreme has 3.7bn shares outstanding pre-transaction and will issue 1.278bn shares to Metallica shareholders for the transaction. As such, non-associated Metallica shareholders will represent 25.6% of total shares post-transaction which is a minor representation in voting power relative to their prior 100% voting power in Metallica Minerals Limited.
- **Project Risk**
Diatreme's Northern Silica projects are at scoping study stage. This early stage of development has not been proven to be economically viable by an independent technical expert and may face unforeseeable factors in order to develop the project in terms of operational costs, environmental requirements, capital expenditures, and other variables which may impact the value of the mine.

By accepting the offer, Metallica shareholders will be exposed to these risks which may determine whether or not these mines are viable and whether they can be funded.

Other Considerations

- **Common Shareholders**

Metallica and Diatreme have common shareholders. Ilwella Pty. Ltd (“Ilwella”) and SCR-Sibelco N.V. (N.V.) are the top two shareholders of both Diatreme and Metallica Minerals. Sibelco publicly backed the takeover offer from Diatreme. Furthermore, Delphi Unternehmensberatung AG (Delphi AG) controls Sparta AG. In particular, Delphi AG owns 100% of VVBeteiligungen AG, a majority shareholder of Deutsche Balaton AG which has a majority ownership of Sparta AG. With Metallica’s top three shareholders being Ilwella, Sibelco and Sparta AG this takeover suggests limited dilution for major shareholders who continue to retain a significant ownership of Diatreme post-takeover of Metallica.

- **Mitsubishi (CFSM) Sublease**

Diatreme is required to build significant port infrastructure near CFSM’s operations and wishes to utilise the existing wharf. The Sublease between Far North Queensland Ports Corporation Ltd and Cape Flattery Silica Mines Pty Ltd (CFSM) gives CFSM certain rights that may make this difficult both during operations and construction. However, PAEMAC’s report states that the construction of Diatreme’s port infrastructure will cause unavoidable disturbances to Mitsubishi’s operations. As such, it gives CFSM reasons to not allow Diatreme to access the existing infrastructure or proceed with the planned construction activities. This would impact Diatreme’s ability to export.

Shareholder circumstances

Advisory Partner has not considered the effect of the Offer on the particular circumstances of individual Shareholders. Some individual Shareholders may place a different emphasis on various aspects of Proposed Transaction from that adopted in this Report. Accordingly, individuals may reach different conclusions as to whether or not the Offer is in their individual best interests. The decision of an individual Shareholder in relation to the Offer may be influenced by their particular circumstances (including their taxation position) and accordingly, Shareholders are advised to seek their own independent advice.

Other matters

This Report has been requested by the Metallica Directors to assist the Shareholders in their decision to accept or reject the Proposed Transaction.

This Report should not be used for any other purpose and Advisory Partner does not accept any responsibility for its use outside this purpose. Except in accordance with the stated purpose, no extract, quote or copy of our Report, in whole or in part, should be reproduced without our written consent, as to the form and context in which it may appear.

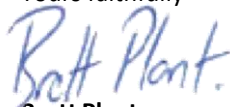
Advisory Partner acknowledges that this Report may be lodged by the Directors with the ASX.

Conclusion

Based on the above, we have concluded that the Offer is “not fair” as the offer amount is below the fair value of a Metallica share. Additionally, we have considered the transaction as “not reasonable” because the disadvantages outweigh the advantages.

This opinion should be read in conjunction with the full text of this report which sets out our findings.

Yours faithfully



Brett Plant
Director

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1.0 Glossary of Terms

Table 2: Glossary of Terms

Term	Meaning
Advisory Partner or we or AP or our	Advisory Partner Connect Pty Ltd
ASIC	Australian Securities and Investment Commission
ASX	Australian Securities Exchange
Bid-Ask Spread	A bid-ask spread is the amount by which the ask price exceeds the bid price for an asset in the market.
Control Premium	An allowance made for the premium for control given the strategic benefit that a controlling interest would provide
Corporations Act	Corporations Act 2001
Diatreme or DRX	Diatreme Resources Limited (ASX:DRX)
Dilution	Dilution refers to the reduction in the percentage of existing shareholders' ownership in a company when it issues new shares of stock.
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation
EBITDA Multiple	The ratio Enterprise Value: Earnings Before Interest Tax Depreciation and Amortisation
Engagement	Our engagement by the Directors of Metallica to prepare this Report in connection with the Offer.
Enterprise Value (EV)	The total value of the business and is equal to Debt + Equity
FOS	Financial Ombudsman Service
Free Float	The shares of a company that can be publicly traded and are not restricted (i.e., held by insiders).
FSG	Financial Services Guide
Future Maintainable Earnings Method	The capitalisation of estimated future maintainable earnings by an appropriate multiple.
FY	Financial Year
HY	Half Year
JORC Code	Joint Ore Reserves Committee (JORC) is a classification system for the public reporting of exploration results, mineral resources and ore reserves.
Liquidity	The ease in which an asset or security can be converted into ready cash without affecting its market price.
LTM	Last Twelve Months
Net Debt	Current Portion of Debt + Non-Current Portion of Debt - Cash and Cash Equivalents
NACE Code	Nomenclature of Economic Activities (NACE) is the European statistical classification of economic activities
NAICS Code	North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments
NPV	Net Present Value
NRV	Net Realisable Value
Report	This independent expert's report
RG 111	Regulatory Guide 111 - Content of Expert Reports
Statistical Outlier	An extremely high or extremely low data point relative to the nearest data point and the rest of the neighbouring co-existing values in a dataset.
Surplus Assets	Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company.

Source: AP Analysis

2.0 Outline of the Offer

2.1 Introduction and Background

Metallica Minerals Limited (ASX:MLM) ("**MLM or Metallica**") is a resource development company with interests in Silica sand and Copper Gold projects in Queensland. Metallica has a proposed Silica Sand mine located in the Cape Flattery Region of Far North Queensland, adjacent to Mitsubishi's Cape Flattery Silica Sand Mines (CFSM). Another mining exploration company, Diatreme Resources Limited (ASX:DRX) ("**DRX or Diatreme**") is an emerging producer of mineral and silica sands. This company also has a proposed project in the same region as Metallica's Silica Sand Project.

Diatreme announced a takeover intention of Metallica on the 16th of February 2024 for all ordinary shares in MLM. Diatreme released a bidder statement on the 28th of March detailing the conditions to the offer. The offer will see Metallica shareholders receive 1.3319 fully paid ordinary shares in Diatreme for every (1) ordinary share in Metallica held by shareholders at the offer date.

Diatreme's bid highlights a premium of 22.08% based on the closing price of both companies on the 15th of February 2024, where DRX's closing price was \$0.022 and MLM's closing price was \$0.024. Along with this, Diatreme has several conditions of the Offer, which include a 50.1% minimum acceptance condition along with Diatreme's shareholders approving the acquisition of Metallica for the purposes of ASX Listing Rule 10.1.

2.2 Key steps and Conditions of the Offer

The Offer has the following elements:

- Metallica shareholders will be offered 1.3319 ordinary shares in Diatreme for each (1) ordinary share in Metallica.
- Diatreme Shareholder Approval Condition:
 - the approval of Diatreme Shareholders for the purpose of Listing Rule 10.1 for the acquisition of the Metallica Shares held by Ilwella and Sibelco (and issue of the Offer Consideration for each Metallica Share held by Ilwella and Sibelco, to Ilwella and Sibelco as consideration under the Offer) (**Listing Rule 10.1 Approval**)
 - a waiver from ASX to permit the acquisition by Diatreme of the Metallica Shares held by Ilwella Pty Ltd and Sibelco Asia Pacific Pty Ltd (and issue of the Offer Consideration for each Metallica Share held by Ilwella and Sibelco, to Ilwella and Sibelco as consideration under the Offer) without first obtaining the Listing Rule 10.1 Approval; or
 - a notice or confirmation from ASX that Diatreme is not required to obtain the Listing Rule 10.1 Approval,
- The Shareholders need to decide at or before the end of the Offer Period whether to accept the offer or not;
- Diatreme will include as a defeating condition to the proposed takeover bid, a condition that Diatreme obtains either the written consent or waiver from Metallica to the acquisition of Metallica Shares under the proposed takeover bid or the Takeovers Panel makes orders and declarations that Diatreme is no longer restrained from acquiring Metallica Shares under the Offer by the terms of the Confidentiality Deed; and
- There is a minimum acceptance condition of 50.1%.

2.3 Outcome of the Proposed Transaction

Should shareholders of Metallica accept the Offer, the company will no longer trade on the ASX and be owned by Diatreme.

The outcome of the proposed transaction would see Metallica Shareholders be diluted, from majority ownership from the outstanding shares in Metallica, to a minority stake of 25% in Diatreme.

Table 3: Ownership Structure of Proposed Transaction

Company	DRX Issued Shares (Post-takeover)	Percentage of Ordinary Capital Post Takeover
Diatreme Resources (including Outstanding Options)	3,729,759,126	73.84%
Metallica Minerals (including Outstanding Options)	1,321,143,472	26.16%
Enlarged Company	5,050,902,598	100.00%

Source: AP Analysis

At present, Ilwella Pty. Ltd., SCR-Sibelco N.V. and Delphi Unternehmensberatung AG are common shareholders of both companies.

The Non-associated shareholders initially held 49.9% of Metallica Minerals, while the top three common shareholders, Ilwella, Sibelco and Sparta AG/ Delphi AG owned 50.1%. However, after the takeover, the Non-associated shareholders are diluted to 12.73% while the ownership of the top two shareholders remain at 41%.

The table below shows the top 10 shareholders if the Proposed transaction is successful.

Table 4: Top 10 shareholders of Proposed transaction

Post Takeover DRX Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital
Ilwella Pty Ltd	1,092,947,033	21.64%
Sibelco Asia Pacific Pty Ltd	959,577,300	19.00%
DELPHI Unternehmensberatung Aktiengesellschaft / Sparta AG	343,461,377	6.80%
Yufeng Zhuang	151,841,819	3.01%
2invest AG	130,434,783	2.58%
Chenfei Zhuang	91,900,000	1.82%
Jie Wu	87,171,308	1.73%
Chenxia Zhou	62,500,000	1.24%
VW Pty Ltd	61,000,001	1.21%
Lai You	53,177,747	1.05%
Top 10 Post Takeover Shareholders	2,980,833,621	59.02%
Other Shareholders	2,070,068,976	40.98%
Total Issued Shares	5,050,902,598	100.00%

Source: AP Analysis

3.0 Purpose, Scope, and Basis of Assessment

3.1 Legislative requirements

Section 640 of the Corporations Law requires an expert opinion to be provided where the bidder is connected with the target company.

Section 640 provides that if:

- (a) the bidder's voting power in the target is 30% or more; or
- (b) for a bidder who is, or includes, an individual — the bidder is a director of the target; or
- (c) for a bidder who is, or includes, a body corporate — a director of the bidder is a director of target.

A target statement given in accordance with subsection 638 must include, or be accompanied by, a report by an expert that states whether, in the expert's opinion, the takeover offer is fair and reasonable and gives the reasons for forming that opinion.'

3.2 Purpose of the report

Advisory Partner has been appointed by the Directors to prepare this report to satisfy the requirement for the preparation of an IER as described above. This report is intended to accompany the target statement to be provided by the Directors to the Shareholders entitled to vote on the Offer ("**Target Statement**").

This report accompanies the Target Statement, required to be provided to the Shareholders, and has been prepared to assist the Directors in fulfilling their obligation to provide shareholders with full and proper disclosure to enable them to assess the merit of the Offer.

This report should not be used for any other purpose, and we do not accept any responsibility for its use outside this purpose. Except in accordance with the stated purpose, no extract, quote or copy of our report, in whole or in part, should be reproduced without our written consent, as to the form and context in which it may appear.

For the purposes of our opinion, the term "fair market value" is defined as the price that would be negotiated in an open and unrestricted market between a knowledgeable, willing, but not anxious purchaser, and a knowledgeable, willing, but not anxious vendor, acting at arm's length.

3.3 Scope

The scope of the procedures we have undertaken in forming our opinion on whether the Offer is fair and reasonable for Shareholders is limited to those procedures we believe are required in order to form our opinion. Our procedures, in the preparation of the report, have not included verification work nor constitute an audit or assurance engagement in accordance with Australian Auditing and Assurance Standards issued by the Australian Auditing and Assurance Standards Board ("**AUS**") or its predecessors. Accordingly, Advisory Partner does not warrant that its inquiries have identified or verified all of the matters which an audit, extensive examination or "due diligence" investigation might disclose.

In preparing this report, we have relied on information provided by various officers of Metallica. We have not undertaken any verification of the financial or other information provided by those officers, or other parties, as set out in this report. Advisory Partner believes the information provided to be reliable, complete and not misleading and has no reason to believe that any material facts have been withheld. The information provided was evaluated through analysis, inquiry and review for the purpose of forming our opinion. Where Advisory Partner has relied on the views and judgement of management the information was also evaluated through analysis, inquiry and review to the extent practical. However, such information is often not capable of external verification or validation.

Metallica has agreed to indemnify Advisory Partner and their partners, directors, employees, officers and agents (as applicable) against any claim, liability, loss or expense, costs or damage, arising out of reliance on

any information or documentation provided by Metallica, which is false and misleading or omits any material particulars, or arising from failure to supply relevant documentation or information.

Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd ACN 643 090 359 Australian Financial Services Licence 526061. As a Corporate Authorised Representative of an Australian Financial Services Licence, we are required to provide a Financial Services Guide in situations where we may be taken as providing financial product advice to retail clients. A copy of Advisory Partner Financial Services Guide is set out in the beginning of this Report.

3.4 Basis of evaluation

In forming our opinion as to whether or not the Offer is fair and reasonable for the Shareholders of Metallica, we have considered the following.

The Corporations Act does not define the expressions “fair” and “reasonable”. However, guidance is provided by the Regulatory Guides issued by ASIC, which establish certain guidelines in respect of independent expert’s reports required under the Corporations Act or commissioned voluntarily. In particular, Regulatory Guide 111 “Content of Expert Reports” (**RG 111**) has been considered.

RG 111 draws a distinction between “fair” and “reasonable”. An offer is fair if the consideration is equal to or greater than the value of the securities subject to the offer. The comparison must be made assuming 100% ownership of the target company irrespective of the percentage holding of the bidder or its associates in the target company.

RG 111 considers an offer to be “reasonable” if:

- The offer is “fair”; or
- Despite not being “fair”, the expert believes that there are sufficient reasons for security holders to accept the offer in the absence of any higher offer.

RG 111 sets out some of the factors that an expert might consider in assessing the reasonableness of an offer including:

- The bidder’s pre-existing voting power in the target company;
- Other significant security holding blocks in the target;
- The liquidity of the market in the target’s securities;
- Taxation losses, cash flow or other benefits arising through achieving 100% ownership of the target;
- Any special value of the target to the bidder;
- The likely market price if the offer is unsuccessful; and
- The value to an alternative bidder and likelihood of an alternative offer being made.

In our opinion, the Offer will be fair if the value is greater than the market value of the securities in Metallica Minerals, inclusive of an appropriate premium for control.

In considering whether the Offer is reasonable, other factors that have been considered include:

- Current financial performance and forecast performance;
- The likelihood of an alternative offer and alternative transactions;
- The likely market price of Metallica Group shares in the absence of the offer; and
- Other advantages and disadvantages for Metallica’s Shareholders of approving the Proposed Transaction.

We have not considered special value in forming our opinion. Special value is the amount which a potential acquirer may be prepared to pay for a business in excess of the fair market value. This premium represents the value to the potential acquirer of potential economies of scale, reduction in competition or other synergies arising from the acquisition of the asset not available to likely purchasers generally. Special value is not normally considered in the assessment of fair market value as it relates to the individual circumstances of special purchasers.

3.5 Reliance on Information

This Report is based upon financial and other information provided by Metallica. Advisory Partner has considered and relied upon this information. Advisory Partner believes the information provided to be reliable, complete and not misleading, and has no reason to believe that any material facts have been withheld. The information provided was evaluated through analysis, inquiry and review for the purpose of forming an opinion as to whether the Offer is fair and reasonable.

Metallica has agreed to indemnify Advisory Partner, and the directors, partners and employees of Advisory Partner and any related entity against any claim arising out of misstatements or omissions in any material supplied by Metallica, its subsidiaries, directors or employees, on which Advisory Partner has relied.

Advisory Partner does not warrant that its inquiries have identified or verified all of the matters which an audit, extensive examination or “due diligence” investigation might disclose. In any event, an opinion as to whether a corporate transaction is fair and reasonable is in the nature of an overall opinion rather than an audit or detailed investigation. Preparation of this Report does not imply that Advisory Partner has audited in any way the financial accounts or other records of the Company.

It is understood that the accounting information provided to Advisory Partner was prepared in accordance with generally accepted accounting principles and except where noted, prepared in a manner consistent with the method of accounting used by the Company, in previous accounting periods.

An important part of the information base used in forming an opinion of the kind expressed in this report are the opinions and judgement of management. This type of information was also evaluated through analysis, inquiry and review to the extent practical. However, such information is often not capable of external verification or validation.

3.6 Current Market Conditions

Our opinion is based on economic, market and other conditions prevailing at the date of this Report. Such conditions can change significantly over relatively short periods of time. Accordingly, changes in those conditions may result in any valuation opinions becoming quickly outdated and in need of revision. Advisory Partner reserves the right to revise any valuation, or other opinion, in the light of material information existing at the date of this Report that subsequently becomes known to Advisory Partner.

3.7 Sources of Information

Appendix A to this Report sets out details of information referred to and relied upon by Advisory Partner during the course of preparing this Report and forming our opinion.

3.8 Assumptions

In forming our opinion, the following has been assumed:

- All relevant parties have complied, and will continue to comply, with all applicable laws and regulations and existing contracts and there are no alleged or actual material breaches of the same or disputes (including, but not limited to, legal proceedings), other than as publicly disclosed and that there has been no formal or informal indication that any relevant party wishes to terminate or materially renegotiate any aspect of any existing contract, agreement or material understanding, other than as publicly disclosed;

- That matters relating to title and ownership of assets (both tangible and intangible) are in good standing, and will remain so, and that there are no material legal proceedings, or disputes, other than as publicly disclosed;
- Information in relation to the Offer provided to the Shareholders or any statutory authority by the parties as part of the bidder's statement or the target's statement is complete, accurate and fairly presented in all material respects; and
- The legal mechanisms to implement the Offer are correct and effective.

4.0 Business Environment

In arriving at our valuation opinion, we have considered the outlook for the Australian economy and the relevant industry affecting Metallica's.

4.1 Economic Analysis

The economic growth of advanced economies has been slow, with the United States being the most robust. This has been evident in GDP data along with indicators such as retail sales and investment intentions. Consumption growth has been slow in advanced economies driven by weakness in goods consumption despite positive growth in real household incomes throughout 2023. Many economies saw saving rates remain higher than pre-pandemic levels and any savings accumulated during COVID-19 are yet to be drawn down. It is expected that more moderation in inflation should reduce the cost-of-living pressures on income levels, supporting consumption growth. However, this may partially be offset as higher cash rates cause the labour market to ease, while increasing loan repayments which may impact household income. This was reflected in most advanced economies, where the labour market has eased gradually since the recent rate hikes of 2023.

Domestically, Australia's GDP growth remains subdued as the level of demand continues to exceed supply. This slowing in GDP growth over the last year has been driven by low growth in household consumption during cost-of-living pressures. Investments into dwellings has also slowed due to labour constraints, especially in the residential construction sector. For the past two years, Australian households saw their real disposable incomes decline, placing pressures on their budgets. Despite the strong growth in nominal labour incomes, the high rate of inflation and high rate of tax payments have offset this effect. This resulted in households by reducing spending, especially for discretionary items. Unlike other economies, Australian households responded to lower real incomes by saving less or drawing down on their savings. The RBA reports that transaction-based spending data implies that nominal spending growth has slowed across most households. Further, mortgagors have faced a large increase in their mortgage payments, due to higher interest rates. However, many investors were able to offset this impact by drawing down on their savings. Overall, Australian households had to adjust in response to the high cost-of-living pressures, especially for households with lower financial buffers.

Housing prices, a good indicator of household wealth, has rebounded over 2023, reaching a new high since the peak of April 2022. House prices have increased amongst most Australian capital cities and regional areas, although price growth has decreased in Sydney and Melbourne. This rebound is reflected by stronger demand for dwellings combined with limited supply due to population growth. Moreover, due to higher interest rates, the economy saw a weakness in dwelling investment. With the rental market remaining tight, and limited supply of rental properties, vacancies at major cities have remained tight, averaging approximately 2% in 2023.

Inflation is forecast to decline to 3.5% by the end of 2024, and further below 3% by 2025. Goods prices have accounted for majority of the decline in inflation to date and is expected to continue falling in the short-term. However, services inflation remains above target but is expected to gradually ease to the end of 2025. In the coming years it is expected there will be an improved balance in the supply and demand across the economy, including labour and product markets, which is expected to support lower inflation while GDP returns to growth. The cash rate is projected to peak at 4.5% before declining to 3.5% by the end of 2025. This has been increased since the August statement. The exchange rate is assumed to remain unchanged at the current level.

The economic outlook is fairly positive going into 2024 as inflation and GDP are expected to trend a return to historical norms. These conditions may provide markets reasonable confidence that companies will continue to operate business as usual. As such, we do not believe that Metallica Minerals will be adversely affected by these economic factors in the near future.

4.2 Industry Analysis

Metallica Minerals' main product is high-quality Silica sand. Traditionally, this commodity was used for the production of glass, foundry, and other chemical industries. However, in recent years, Silica sand has been growing demand in the renewable energy sector for the production of photovoltaic cells in solar panels.

The demand for High Purity Silica Sand (HPPS) has been growing rapidly in Asia over the last 5-years with a CAGR of 8.4%. China's demand for imported silica sand has grown faster at 27.9% CAGR, resulting in a foreseeable deficit of 4 million tonnes (Mt) or more by 2026. The main driver for this demand is the increasing need for photovoltaic (PV) glass in the solar industry, which relies heavily on the supply of HPSS.

Australia has been the dominant supplier of HPPS Asia-Pacific markets, particularly China, Japan, Taiwan, and South Korea, with exports totalling 3,897,978 metric tonnes. The high purity silica sand produces at Cape Flattery is well-positioned to meet this demand due to its specification, logistics advantages and because it is already a well-recognised product.

The demand for HPSS is expected to continue its exponential growth driven by the structural transition from fossil fuels to renewables, and specifically solar. China remains the leading global producer of solar glass, with HPSS making up approximately 72.2% of every 100kg of PV glass.

Competition for supply of Australian HPSS exists primarily from domestic suppliers in China and seaborne suppliers from Indonesia and Malaysia. However, China will not be able to meet the demand of HPSS unless there is a significant increase in its silica sand acid washing capacity and efficiency. Indonesia entered the market in 2020 and ships its silica sand almost exclusively to China, while Malaysia supplied 1,333,000 MT of silica sand exports to China in 2022.

The demand for HPSS is underpinned by long-term global growth drivers, including the shift towards renewable energy and the transition away from fossil fuels. Solar power generation is a key driver for the demand of HPSS, as it is an essential ingredient in the production of photovoltaic glass.

5.0 Metallica Minerals

5.1 Company overview

Metallica Minerals Limited engages in the development, evaluation, and exploration of mineral properties in Australia. It explores for silica sand, copper, and gold projects. The company's flagship property is the 100% owned Cape Flattery Silica Sand Project covering an area of 36 Km² exploration tenure located in Northern Queensland. Metallica Minerals Limited was incorporated in 1997 and is based in Fortitude Valley, Australia.

5.2 Projects

The table below highlights the key projects and their descriptions.

Table 5: Metallica Minerals' Projects

Project	Description
Cape Flattery Silica Sand	The Cape Flattery Silica Sand project is located on the eastern coastline of Cape York Peninsula and adjacent to the Cape Flattery Silica Sand operation owned by Mitsubishi. Metallica's CFS project has completed and released a Definitive Feasibility Study.
Clermont	The Clermont Copper/Gold Project is situated near the town of Clermont in central Queensland. The project is prospective for porphyry and strata bound bulk tonnage copper/gold deposits along with mesothermal gold deposits.

Source: Capital IQ

Advisory Partner notes this project is yet to have JORC resources identified. We were able to identify a comparable transaction in the sale of the Nullagine Gold Project on December 2023.

We note that the project is jointly owned by Metallica (51%) and Diatreme (49%) so any value applied to the Clermont project would have a proportionate affect to both companies.

5.3 Cape Flattery Silica Sand Project (CFS)

Metallica Minerals announced an updated Definitive Feasibility Study (DFS) Cape Flattery Silica Sand Project in November 2023. This project holds 47 million tonnes (Mt) of Probable Ore Reserves @ 99.18% SiO₂ which is to be processed across the 15-year life of the project. The Updated DFS does not include the inferred resources for the Western Area of EPM 25734. The DFS was prepared by Metallica Management with support from Turner & Townsend JukesTodd.

The CFS Project is designed to utilise conventional mining equipment and 'off the shelf' processing plant within the same, small footprint.

The report by Paemac indicates the Metallica infrastructure solution as detailed in the Definitive Feasibility Study may have some advantage. While it is difficult to quantify this advantage, we think it important for shareholders when considering the merits the transaction.

The key components of the project are:

- Silica sand processing plants;
- Overland conveyor from the product stockpile to the Jetty Infrastructure Area (JIA);
- Barge Loading Facility (BLF) and associated jetty (located two to three nautical miles to ocean going transshipment zone);
- Material Offload Facility (MOF) for delivery of personnel and supplies by marine vessels;
- Purpose-built accommodation facility for 52 people;
- Barging and transshipment operations
- Site access road to the jetty;
- Site-wide services;
- Mine Infrastructure Area (MIA) facilities; and
- Two (2) Product stockpile of 100,000 tonnes each.

5.4 CFS Project Resources & Reserves

The Probable Ore Reserve of 47Mt at 99.11%SiO₂ represents 95% of the Mineral Resource of 49.5Mt at 99.10% SiO₂. The following is an overview of the resource category areas within Metallica mining lease.

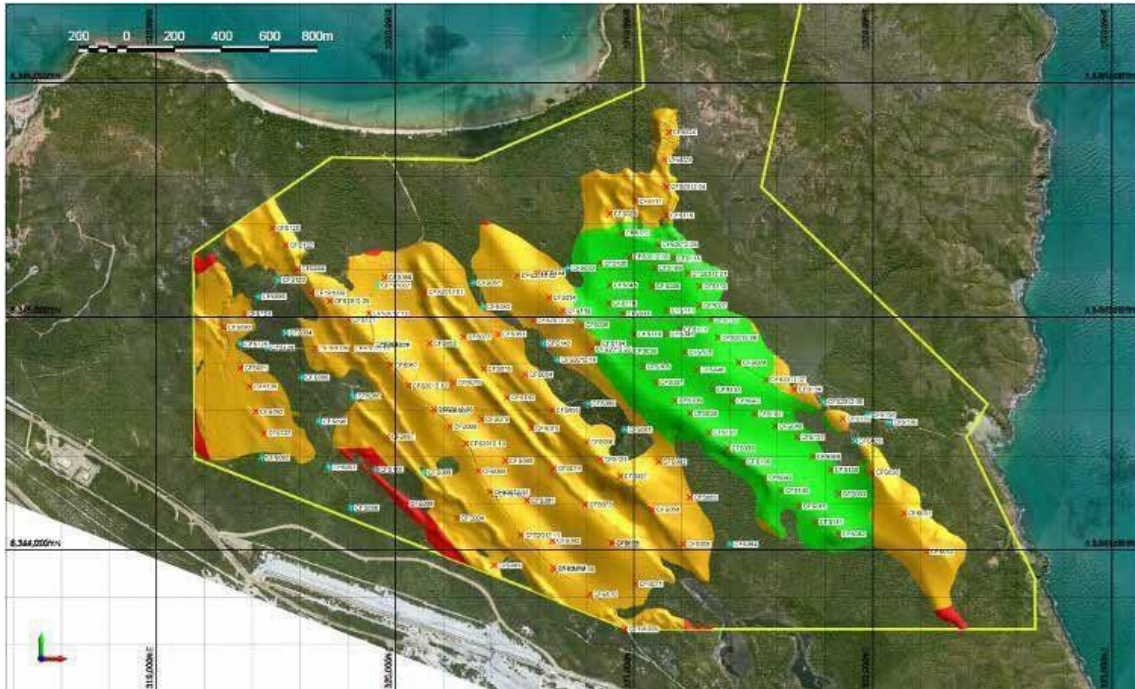


Image 1: Overview of Drillholes and Resource Category Areas with Mining Lease (ML) boundary.

Metallica Minerals owns mineral resources of 49.5 Mt which includes results from 2019 drilling campaigns (hand auger), December 2020, July/August 2021, and December 2021. The data from these drilling campaigns were used to in the resource estimate for the CFS project.

Table 6: Metallica Minerals Ore Reserves

Ore Reserve	Tonnage (Mt)	SiO ₂ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	Al ₂ O ₃ (%)	LOI (%)	Waste Mt
Probable Reserve	47	99.11	0.09	0.14	0.15	0.24	4.0

Source: Metallica Minerals, Definitive Feasibility Study November 2023

Table 7: Metallica Minerals JORC Resources

Resource Category	Tonnage (Mt)	SiO ₂ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	Al ₂ O ₃ (%)	LOI (%)	Density t/m ³	Silica Sand Mm ³
Measured	16.1	99.20	0.08	0.12	0.22	0.13	1.6	10.1
Indicated	33.2	99.05	0.1	0.18	0.25	0.15	1.6	20.7
Inferred	0.2	99.00	0.12	0.27	0.28	0.13	1.6	0.1
Total	49.5	99.10	0.09	0.16	0.24	0.14	1.6	30.9

Source: Metallica Minerals, Definitive Feasibility Study November 2023

5.5 Exploration Tenements

As at the date of this report, Metallica holds the following tenements:

Table 8: Metallica Minerals' Tenements

Tenement	Project	Status	Commenced	Grant	Expiry	Area HA	Area S/B	Area Km ²
EPM 25734	Cape Flattery	C	25/05/2015	25/05/2020	24/05/2025	0	11	54.4
ML 100284	Cape Flattery	A	15/06/2021	-	-	615.9	0	-

Source: Metallica Minerals

5.6 Key Personnel

The Executives and Directors of Metallica are detailed in the table below.

Table 9: Executives of Metallica Minerals

Name & Position	Description
Theo Psaros Executive Chairman	Theo Psaros, GAICD, CA, BFinAdmin, is the Executive Chairman of Metallica Minerals Limited since May 21, 2020, with extensive experience in key executive and resource industry roles, including CFO and COO of MetroCoal Limited. He has also served as Non-Executive Director at Mobilicom Limited from January 20, 2021, to July 05, 2021.
Mark Bojanjac Non-Executive Board Director	Mark Trevor Bojanjac, B.com, CA, ICAA, is an Independent Non-Executive Director of Metallica Minerals Limited since May 13, 2021. He serves as Executive Chairman of PolarX Limited and has held various roles, including CEO of Adamus Resources Limited. Bojanjac, a Chartered Accountant, has a successful track record in developing resource companies and co-founding gold projects in Australia, Mongolia, and China.
Brad Sampson Non-Executive Board Director	Stuart Bradley Sampson, also known as Brad, is an Independent Non-Executive Director at Metallica Minerals Limited since May 13, 2021. With extensive resources industry experience, he served as the CEO of Kore Potash Plc and Tiger Resources Limited. Sampson has held leadership roles covering the entire mining cycle, including exploration, development, operations, and closure. He is a seasoned business leader, director, and mining professional with notable contributions to the Australian resources industry.
Scott Waddell CFO & Company Secretary	Andrew Scott Victor Waddell, B.Bus, FCPA, AGIA, is the CFO of Metallica Minerals Limited since May 21, 2020 and Company Secretary since December 8, 2020. Previously an Interim CEO until May 21, 2020 and Executive Director from February 2019 until August 31, 2021. With rich resources experience from companies like Metro Mining Ltd. Cape Alumina Ltd, Anglo American Metallurgical Coal, and Rio Tinto Alcan, he brings expertise in finance and business improvement. A Fellow of CPA, he holds postgraduate qualifications and is an Associate Member of the Governance Institute of Australia.
Sam Fisher Commercial General Manager	Sam Fisher is a highly credentialled senior executive, with demonstrated commercial success over 25 years in the resources and mining sector, specialising in multi-commodity strategy, sales, trading and marketing, logistics and supply chain. He is experienced in strategic business development, identifying and developing new business opportunities, developing new markets, and strengthening existing relationships. Sam joined Metallica Minerals on 17 October 2022.
Nicholas Villa CFS Project General Manager	Nicholas Villa, BSc (Hons), DipPM, MAIG, has over 23 years' experience as a mining professional, he is well practiced in the delivery of resource projects, taking them from early exploration phase through to production. Nicholas has managed bulk commodity operations both as the Principal and as Contractor, fulfilling senior management roles including Mining Manager, Project Manager and Site Senior Executive. Thoroughly versed in Queensland resource project approvals processes including Environmental Studies and Native Title negotiations. Nicholas was Project Manager for the team that successfully delivered Metro Mining's Bauxite Hills mine to full production in Northern Cape York. Nicholas joined Metallica Minerals in June 2021.

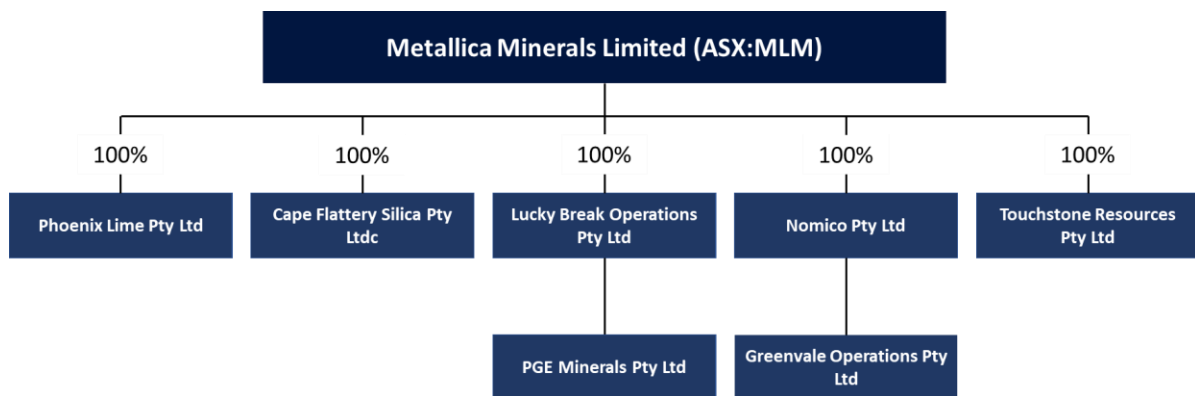
Name & Position	Description
Pat Smith Geology/Exploration Manager	Pat Smith, BSc, MScMiningGeol, MAusIMM, serves as the Geology/Exploration Manager at Metallica Minerals Ltd. With a background in Cyprus Gold and Arimco Gold Pty Ltd, he excels in exploration across Australia, Papua New Guinea, and the Solomon Islands. Graduating from the Cambourne School of Mines in 1987, Mr. Smith brings diverse expertise, from grassroots exploration to feasibility studies.

Source: Metallica Minerals Management

5.7 Ownership and Capital Structure

Metallica has the following 100% owned subsidiaries:

Figure 1: Metallica's Corporate Structure



Source: Metallica Minerals Management

As at 31st of December 2023, Metallica has 959,923,922 total shares outstanding. The top 10 shareholders and total ordinary shares as at 31st of December 2023 are summarised below.

Table 10: Top 10 Shareholders as at 31st of December 2023

As of 31st of December 2023 Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital
Ilwella Pty Ltd	231,451,245	24.11%
Sibelco Asia Pacific Pty Ltd	157,715,500	16.43%
Sparta AG	92,046,350	9.59%
Dostal Nominees Pty Ltd	29,359,998	3.06%
Rookharp Capital Pty Ltd	24,680,450	2.57%
Citicorp Nominees Pty Ltd	14,570,652	1.52%
Gefrato Tading Pty Ltd	10,100,000	1.05%
Plan-1 Pty Ltd	9,712,501	1.01%
Shadbolt Future Fund (Tottenham) Pty Ltd	8,190,000	0.85%
Sophjak Pty Ltd	7,026,315	0.73%
Top 10 Shareholders	584,853,011	60.93%
Other Shareholders	375,070,911	39.07%
Total Issued Shares	959,923,922	100.00%

Source: Metallica Minerals

5.8 Outstanding Options

At 31st of March 2024, the following is the total unissued ordinary shares of MLM under option.

Table 11: Metallica Minerals' Options

Grant Date	Expiry Date	Exercise Price	Number under option
3 August 2011	No Expiry Date*	0.7	1,000,000
29 November 2023	29 November 2028	0.045	32,000,000
Total			33,000,000

Source: Metallica Minerals Annual Report FY23 & Metallica Minerals Management

The options granted in August 2011 are subject to expire 3-years after the decision is made to mine at Lucknow or Kokomo. As at the date of this report, the share price of Metallica Minerals Limited is 0.024.

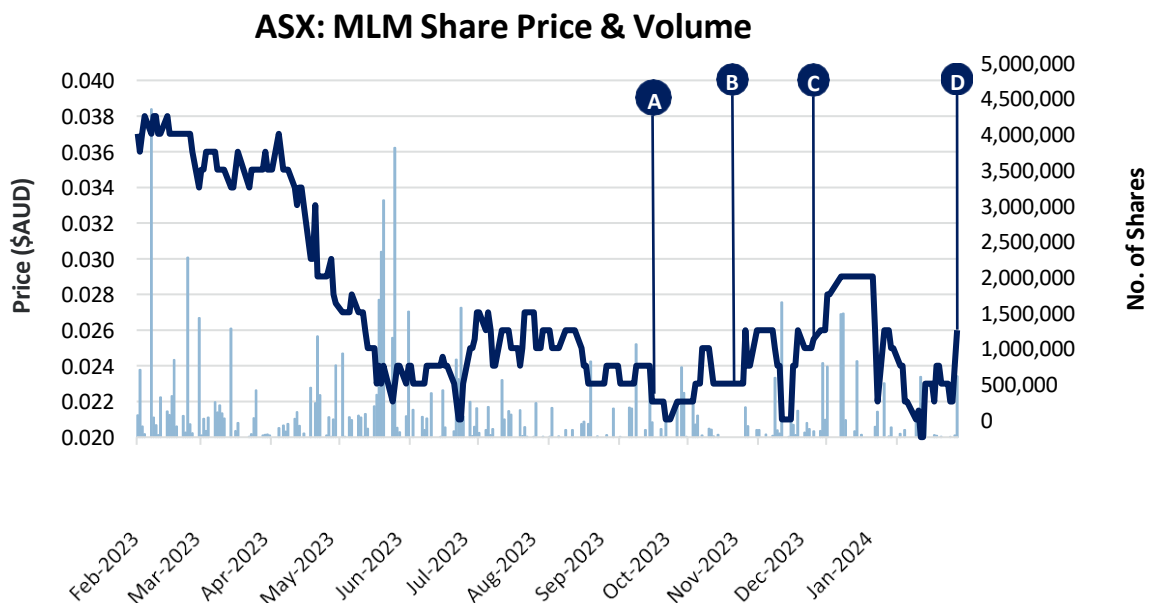
5.9 Share Price Analysis

In order to assess the reliability of using the traded market price of MLM's shares as a basis for determining the fair market value of the shares in MLM we have had regard to:

- the liquidity of the stock over the trading period;
- the 'spread' of ordinary shareholders and the total number of ordinary shares that they hold in the Company, taking into account any trading or other restrictions applicable to the quoted ordinary shares;
- the level of trading activity of the quoted ordinary shares in the Company (i.e. the volume of trades of the quoted ordinary shares in the market as a percentage of the total quoted ordinary shares, and the frequency of the trades);
- the number and frequency of 'unusual' and/or 'abnormal' trading that takes place in the Company's quoted ordinary shares;
- the presence of any factors that may indicate that trading in the shares is the result of significant speculative trading; and
- the level of knowledge that the 'willing' buyers and sellers have in respect of the Company and the market in which it operates.

We have analysed Metallica's daily share close price and volume traded during the period from 16th of February 2023 to 16th of February 2024.

Figure 2: Metallica Share Price Analysis



A comprehensive list of events disclosed by Metallica's company announcements during the past year which may have impacted Metallica's share price movements and trading volumes are set out on the following page. Announcements which may have corresponded to a significant impact (> 10%) on shares prices and trading volumes are highlighted.

Table 12: Metallica's Recent Company Announcements

Date	Announcement	Event	Prior Day Share Price	Share Price on Announcement	% Change
12 February 2024	Cape Flattery Silica Sand Project Update	D	0.023	0.023	0%
30 January 2024	Change of Director's Interest Notice x 3		0.021	0.0215	2%
15 December 2023	CFS Project declared a Coordinated Project	C	0.025	0.0255	2%
12 December 2023	Cape Flattery Silica signs MOU with Eternal Asia		0.025	0.025	0%
11 December 2023	Drilling Commences at Leo Grande Graphite / Gold Prospect		0.026	0.025	-4%
22 November 2023	Results of Annual General Meeting		0.026	0.026	0%
20 November 2023	Metallica Minerals webinar and update		0.024	0.026	8%
14 November 2023	Cape Flattery Silica Updated DFS Supports 3MTPA Sales	B	0.023	0.023	0%
31 October 2023	Supplementary Notice of Annual General Meeting		0.025	0.024	-4%
11 October 2023	Appendix 4G		0.022	0.021	-5%
25 September 2023	Cape Flattery Silica Sand Project Update	A	0.023	0.023	0%
19 September 2023	Bulk metallurgical tests confirm High Purity Silica at CFS		0.024	0.024	0%
5 September 2023	Revised Change of Director's Interest Notice		0.025	0.024	-4%
25 August 2023	Change of Director's Interest Notice		0.025	0.025	0%
24 August 2023	Application for quotation of securities - MLM		0.025	0.025	0%
17 August 2023	Change in substantial holding		0.025	0.025	0%
3 August 2023	Change of Director's Interest Notice x 3		0.026	0.026	0%
1 August 2023	Lapse of Performance Rights		0.026	0.026	0%
17 July 2023	Cape Flattery Silica DFS confirms excellent economics		0.023	0.025	9%
5 July 2023	Further drilling completed at Clermont (EPM17968)		0.024	0.0245	2%
28 June 2023	QLD Govt new critical mineral strategy - Cape Flattery		0.023	0.024	4%
1 June 2023	Extension of MOU to explore off-take arrangements		0.027	0.026	-4%
17 May 2023	Change in substantial holding		0.0295	0.03	2%
11 May 2023	Cape Flattery Silica Sand Project Update		0.033	0.029	-12%
15 March 2023	Results of General Meeting		0.037	0.037	0%
13 March 2023	Change in substantial holding		0.037	0.037	0%

3 March 2023	Maiden Inferred Resource of 12Mt estimated for CFS West	0.037	0.037	0%
20 February 2023	CFS Project Federal Environmental Approval Process Update	NA	0.036	-

Source: Capital IQ, ASX, AP Analysis

Notable announcements which may have had a significant impact on Metallica's share price include:

- 19/02/2024 - Gold Exploration Target established for Leo Grande Project**
 The company had announced a JORC exploration target of 150,000 – 2,300,000 ounces of gold at the project. The quantity and grade of the target is conceptual in nature and is an approximation. The project is yet to estimate a mineral resource.
- 19/02/2024 - Diatrema intention to make takeover offer for Metallica Minerals**
 Metallica Minerals issued a response regarding Diatrema's conditional intention to make a takeover bid announced on the 16th of February 2024. The Metallica Board recommended that shareholders take no action pending a formal response and recommendation from the Metallica Board.
- 11/05/2023 - Cape Flattery Silica Sand Project Update**
 Metallica Minerals announced an update regarding the Cape Flattery Silica Sand Project, stating the definitive feasibility study is advancing for the project. The recent requirement for an Environmental Impact Statement (EIS) will result in delays to the project's approval and timing on construction.

The following tables outline Metallica's trading data. The past 12-months of trading data was used to determine daily turnover and monthly volumes. Typically, the large sophisticated and founding shareholders of small-cap companies are not traders of their shares.

Table 13: Metallica's Share Overview

Company	Ticker	Shares Outstanding	Free Float
Metallica Minerals	ASX:MLM	959,923,922	431,293,818

The following table is a summary of Metallica Mineral's 12-month trading data including average daily volume, low price, high price and closing price.

Table 14: Metallica 12 month trading data

ASX:MLM	Avg. Daily Volume	Low (\$AUD)	Share Pricing High (\$AUD)	Close (\$AUD)
Month Ended				
Mar-23	458,598	0.034	0.038	0.035
Apr-23	181,577	0.034	0.037	0.035
May-23	339,559	0.027	0.034	0.027
Jun-23	847,840	0.022	0.026	0.024
Jul-23	355,196	0.021	0.027	0.026
Aug-23	111,994	0.024	0.027	0.026
Sep-23	200,468	0.023	0.026	0.024
Oct-23	233,099	0.021	0.025	0.024
Nov-23	84,112	0.023	0.026	0.024
Dec-23	464,747	0.021	0.029	0.029
Jan-24	178,320	0.020	0.029	0.020
Feb-24	125,996	0.020	0.026	0.026

- DB:MM4 listed on Deutsche Boerse AG
- ASX:MLM listed on Australian Securities Exchange
- CHIA:MLM listed on Chi-X Australia
- OTCBK:MLMZ.F listed on OTC Pink

Table 15: Metallica's Liquidity Analysis

Month End	Volume Traded	Volume Traded as % of Total Shares	Cumulative Volume Traded as % of Total Shares	Volume Traded as % of Free Float Shares	Cumulative Volume Traded as % of Free Float Shares
Mar 2023	11,663,883	1.2%	1.2%	2.7%	2.7%
Apr 2023	4,094,162	0.4%	1.6%	0.9%	3.7%
May 2023	8,768,965	0.9%	2.6%	2.0%	5.7%
Jun 2023	21,567,304	2.2%	4.8%	5.0%	10.7%
Jul 2023	10,561,374	1.1%	5.9%	2.4%	13.1%
Aug 2023	2,860,363	0.3%	6.2%	0.7%	13.8%
Sep 2023	4,660,707	0.5%	6.7%	1.1%	14.9%
Oct 2023	5,524,663	0.6%	7.3%	1.3%	16.2%
Nov 2023	2,114,460	0.2%	7.5%	0.5%	16.7%
Dec 2023	12,381,419	1.3%	8.8%	2.9%	19.5%
Jan 2024	4,552,247	0.5%	9.2%	1.1%	20.6%
Feb 2024	4,447,648	0.5%	9.7%	1.0%	21.6%
Min	2,114,460	0.2%		0.5%	
Average	7,766,433	0.8%		1.8%	
Median	5,092,685	0.5%		1.2%	
Max	21,567,304	2.2%		5.0%	

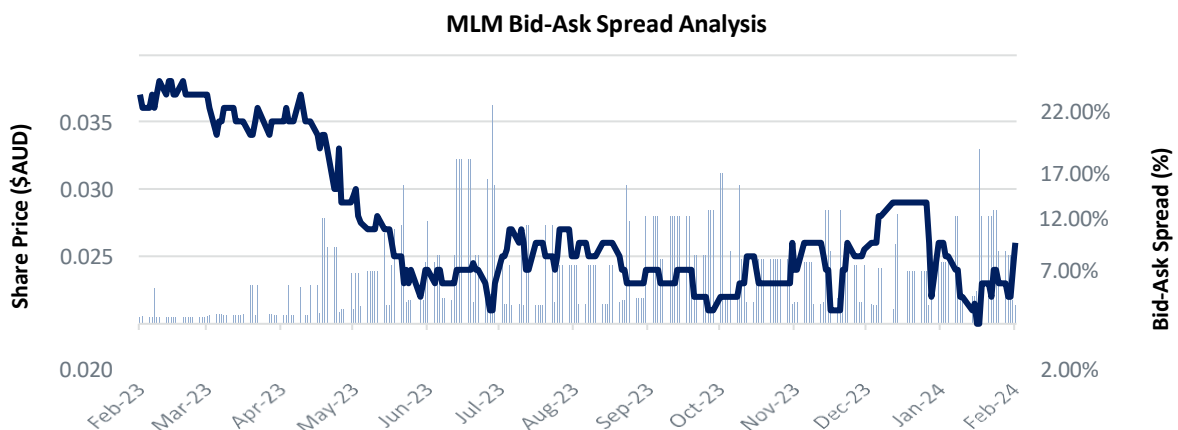
**Note: Feb-24 contains data up to 16th of February 2024*
Source: Capital IQ & AP Analysis

We note the following regarding Metallica's volume and liquidity data from March 2023 to February 2024:

- the cumulative volume traded of total shares is 9.7% over this period.
- the maximum monthly volume traded as a percentage of total shares is 2.2%.
- the cumulative volume of free float shares is 21.6%.
- the maximum monthly volume traded as a percentage of free float is 5.0%.
- monthly volumes ranged from 2,114,460 in November 2023 to 21,567,304 in June 2023.

We have analysed the bid and ask spread in trading data for the previous 12-months. The below chart demonstrates the bid and ask spread from 16th of February 2023 to 16th of February 2024.

Figure 3: Metallica's Bid-Ask Spread



Source: Capital IQ and AP Analysis

Date

Bid-Ask Spread

Share Price





In regard to the data provided above, we note the following:

- the minimum spread is 2.56%
- the median spread is 6.90%
- the average spread is 6.94%
- the maximum spread is 22.22%

We consider Metallica Minerals shares to be illiquid based on an average bid-ask spread of 7% and an annual cumulative volume as a percentage of total shares under 10%.

5.10 Volume Weighted Average Price

We have reviewed the following factors relating to the trading activity of MLM's shares on the ASX:

- the daily high, low and closing share price of trades of MLM;
- the daily volume of MLM share trading; and
- the volume weighted average share price ("VWAP") of MLM.

Table 16: Metallica's VWAP

Metallica VWAP	Low	High	VWAP
Up to 16th February 2024			
1 Day	0.0200	0.0380	0.0257
5 Day	0.0208	0.0376	0.0256
10 Day	0.0213	0.0373	0.0246
1 Month	0.0222	0.0368	0.0225
2 Month	0.0227	0.0363	0.0264
3 Month	0.0229	0.0350	0.0255

Source: Capital IQ & AP Analysis

We note the following regarding with respect to the share price of MLM in the 3-months leading up to the intention to takeover announcement on the 19th of February 2024.

- The VWAP ranges from \$0.0225 (1-month) to \$0.0264 (2-month).
- The 3-month VWAP is at \$0.0255 which is lower than the offer.

5.11 Capital Raisings

The following is a complete capital raising history of Metallica Minerals. The recent higher offer was 145m shares at \$0.035 announced on 30th of November 2022. This is a substantial raising as it accounts for 15.1% of the current outstanding share count.

Table 17: Metallica Minerals' Recent Capital Raisings

Announce Date	Offering Type	Offering Price	Shares Offered	Total Capital
30 November 2022	Private Placement - Common Stock	0.035	145,000,000	5,075,000
30 November 2022	Common Stock - Subscription Rights Offering	0.032	141,199,221	4,518,375
16 February 2022	Private Placement - Common Stock	0.031	97,903,226	3,035,000
20 September 2021	Common Stock - Other	NA	NA	NA
22 April 2021	Common Stock - Other	0.030	71,166,665	2,135,000
25 March 2021	Common Stock - Subscription Rights Offering	0.030	162,188,704	4,865,661
19 April 2017	Common Stock - Other	0.050	5,377,769	268,888
3 September 2017	Common Stock - Subscription Rights Offering	0.050	58,822,231	2,941,112
25 February 2016	Common Stock - Subscription Rights Offering	0.030	59,871,319	1,796,140
18 August 2014	Private Placement - Common Stock	0.080	6,250,000	500,000

Source: Capital IQ & Metallica Management

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5.12 Historical Profit and Loss

We detail below the past 3 years Profit and Loss for Metallica.

Table 18: Metallica's historical Profit and Loss

Consolidated Statements of Comprehensive Income	Actual			
	FY21	FY22	FY23	HY24*
Revenue				
Revenues	49,221	4,182	NA	NA
Interest Revenues	8,034	7,770	86,482	92,470
Other Income	220,342	2,500	NA	NA
Total Revenue	277,597	14,452	86,482	92,470
Expenses				
Employee Benefit Expense	-372,460	-857,204	-634,829	-761,013
Rental Expenses	-89,936	-41,413	-28,654	-16,468
Professional Fees	-113,436	-148,033	-265,797	-138,814
Legal Fees	-50,545	-35,911	-65,281	-26,355
Extraordinary General Meeting Costs	-6,000	-14,667	NA	NA
Airfares and Conferences	-41,254	-37,521	-73,924	-9,856
Exploration Costs	-279,878	-306,391	-77,035	-55,648
Impairment of Exploration and Evaluation Expenditure	NA	NA	-635,494	NA
Other Expenses	-214,305	-388,886	-345,243	-172,159
Depreciation and Amortization	-18,421	-85,372	-111,453	-54,435
Finance Costs	NA	-18,516	-19,683	-8,891
Listing Fees and Registry Expense	-96,599	-87,732	-78,084	-55,415
Net Loss on Disposal of Subsidiary and Joint Operation	-2,049,754	NA	NA	NA
Total Expenses	-3,332,588	-2,021,646	-2,335,477	-1,299,054
Pre-tax Income	-3,054,991	-2,007,194	-2,248,995	-1,206,584
Taxes and Other Expenses				
Income Tax	0	0	0	0
Loss For The Period	-3,054,991	-2,007,194	-2,248,995	-1,206,584

Source: Capital IQ

5.13 Historical Balance Sheet

We detail below the historical balance sheet for Metallica as at 30 June 2021, 2022 and 2023.

Table 19: Metallica's Historical and Current Balance Sheet

Consolidated Statements of Financial Position	FY21	Actual FY22	FY23	HY24*
ASSETS				
Current Assets				
Cash and Cash Equivalents	7,531,567	5,259,695	7,106,924	4,821,125
Trade and Other Receivables	45,923	59,525	23,432	33
Total Current Assets	7,577,490	5,319,220	7,130,356	4,821,158
Non-Current Assets				
Right of Use Assets	NA	476,467	399,202	360,570
Exploration & Evaluation	1,183,081	5,160,459	10,382,182	11,790,539
Property, Plant and Equipment	10,788	100,105	103,812	94,073
Other Non-Current Assets	48,443	73,498	67,498	67,498
Total Non-Current Assets	1,242,312	5,810,529	10,952,694	12,312,680
Total Assets	8,819,802	11,129,749	18,083,050	17,133,838
LIABILITIES				
Current Liabilities				
Trade and Other Payables	382,022	838,600	670,910	417,056
Employee Benefits	11,447	39,713	94,534	98,485
Lease Liabilities	NA	63,163	68,878	71,870
Total Current Liabilities	393,469	941,476	834,322	587,411
Non-Current Liabilities				
Lease Liabilities	NA	425,282	356,404	319,585
Provisions	NA	3,842	3,842	3,927
Total Non-Current Liabilities	-	429,124	360,246	323,512
Total Liabilities	393,469	1,370,600	1,194,568	910,923
Net Assets	8,426,333	9,759,149	16,888,482	16,222,915
Equity				
Common Stock	50,896,470	53,865,383	63,293,132	63,447,229
Accumulated profit/loss	(42,689,884)	(44,697,078)	(46,696,420)	(47,903,004)
Reserves	219,747	590,844	291,770	678,690
Total Equity	8,426,333	9,759,149	16,888,482	16,222,915

Source: Capital IQ

5.14 Historical Cash Flow Statement

We detail below the historical Cash Flow Statement for Metallica as at 30 June 2021, 2022 and 2023.

Table 20: Metallica Historical Cash Flow Statement

Consolidated Statement of Cash Flows	FY21	Actual FY22	FY23	HY24*
Cash flow from operating activities				
Receipts from customers, government grants and other (inclusive of GST)	256,644	8,976	740	-
Payments to suppliers and employees (inclusive of GST)	(1,198,239)	(1,073,871)	(1,551,585)	(627,136)
Interest Received	8,034	7,770	86,482	92,470
Interest Paid	-	(18,516)	(19,683)	(8,891)
Net Cash Used in Operating Activities	(933,561)	(1,075,641)	(1,484,046)	(543,557)
Cash flows from investing activities				
Payments for property, plant and equipment	(5,665)	(110,302)	(37,895)	(6,063)
Payments for exploration and evaluation assets	(1,183,081)	(3,977,378)	(5,857,217)	(1,702,352)
Payments for security deposits	(15,805)	(25,055)	-	-
Receipt for security deposit	-	-	6,000	-
Sale proceeds - HMS plant and tenements	330,000	-	-	-
Proceeds from disposal of subsidiary and joint operation	41,737	-	-	-
Net Cash Used in Investing Activities	(832,814)	(4,112,735)	(5,889,112)	(1,708,415)
Cash flows from financing activities				
Proceeds from issue of shares	7,000,661	3,044,000	9,883,375	-
Share issue transaction costs	(500,524)	(78,087)	(599,825)	-
Repayment of lease liabilities principal	-	(52,409)	(63,163)	(33,827)
Net Cash Used in Financing Activities	6,500,137	2,913,504	9,220,387	(33,827)
Net increase/(decrease) in cash and cash equivalents	4,734,032	(2,271,872)	1,847,229	(2,285,799)
Cash and cash equivalents at the beginning of the financial year	2,797,535	7,531,567	5,259,695	7,106,924
Cash and cash equivalents at the end of the financial year	7,531,567	5,259,695	7,106,924	4,821,125

5.15 Silica Sand Market Overview

The 2026 pricing estimate for a high-grade low iron Cape Flattery HPSS product has been revised to FOB USD 54.00 to USD 65.00 / AUD 75.00 to AUD 90.28 per tonne as per the Prime Gain Limited market report. The revision is based on a larger foreseeable supply shortfall of HPSS, particularly to the PV glass industry where demand is growing exponentially. The pricing estimate assumes quality product is produced and reliably supplied at sufficient scale, with efficient logistics and freight access convenience.

Current CIF market pricing of high-grade low iron silica sand imported to China from Australia is in the region of USD 60.00 plus per tonne. Current domestic China supply of HPSS is pricing in the range of RMB 400 to RMB 460 / USD 57.85 to USD 66.54 per tonne (delivered to factory gate).

Pricing will vary according to contract terms and supply arrangements including quality and minimum volume commitments over time, terms of trade, cost of freight, nature of the buyer, buyer history, competition, and development in processing technology. Currently, there is insufficient supply of high-grade silica sand with low iron, driving the demand for seaborne imported product. This demand is driven by the PV glass industry across Asia, particularly in China. The demand for PV glass tracks solar panel demand, which is projected to grow per all IEA scenarios through to 2030 at a CAGR between 15% to 25% (the IEA uses a CAGR of 21.2% for solar power capacity).

In parallel, significant demand supply pressure is being experienced in relation to high grade quartz used in quartz crucibles for solar (demand 2022 to 2023 estimated growth of 37%), with corresponding increases in price of product. In relation to copper, there are foreseeable supply shortages and corresponding projected record pricing, demand being supported by the “green transition”.

6.0 Valuation of Metallica's Shares

6.1 Valuation Methodology Adopted

We have considered the various valuation methods as set out in Appendix B in the course of arriving at our valuation conclusion. In our opinion, the most appropriate method with which to value MLM is a sum of parts valuation for assets owned by Metallica Minerals. This valuation method considers the separate valuation of the assets and liabilities of a company. The valuation methodologies adopted for each key asset owned by Metallica Minerals is detailed below:

Table 21: Description of Metallica Minerals' Assets

Asset	Description
Cape Flattery Silica Sand Project	The company has a definitive feasibility study (DFS) which involved a detailed life of mine (LOM) model conducted by a technical expert which we have used in undertaking our valuation. To further assist in our analysis, we have engaged SRK to review and comment on the reasonableness of the assumptions underlying the Definitive Feasibility Study. Refer to Appendix A for a description of work that SRK was engaged to undertake.
Other resources	Metallica has other JORC deposits which may produce sales in the future and is not included in the Cape Flattery DFS. We have valued these resources based on an EV/Resources method.
Other assets and liabilities	We will consider the value of the remaining assets and liabilities of Metallica.

Source: AP Analysis

In assessing the most appropriate valuation method, we have provided reasons to reject other methodologies in valuing Metallica Minerals:

- We have assessed the liquidity of Metallica Minerals shares in Section 4.7 and concluded the shares are thinly traded. As such, we consider that the quoted market price valuation method is not appropriate to value the shares in the company.
- The company at the time of this report is not profitable, nor does it have a history of earnings in which a multiple can be applied to determine a value. It is generally not appropriate to apply a multiple of earnings to value a mining company due to the unique capital and operating requirements of each project, their respective exploration and development stages, environmental and regulatory factors along with other unique mining issues. These factors make it difficult to find a comparable company for valuation.
- We do not consider the Discounted Cash Flow (DCF) method to be appropriate to value Metallica Minerals as a whole as we do not have any reliable information with regard to future cashflows of the entire company. However, we do have reliable information in regard to the future cash flows in the Cape Flattery Silica Sand Project as per the Definitive Feasibility Study and have applied the DCF method to value these resources.

6.2 Sum of Parts

Asset-based valuations involve the determination of the fair market value of a business based on the net realisable value of the assets used in the business.

Valuation of net realisable assets involves:

- separating the business or entity into components which can be readily sold, such as individual business units or collection of individual items of plant and equipment and other net assets; and
- ascribing a value to each based on the amount that could be obtained for this asset if sold.

The value of the assets can be determined on the basis of:

- *orderly realisation*: this method estimates fair market value by determining the net assets of the underlying business including an allowance for the reasonable costs of carrying out the sale of assets, taxation charges and the time value of money assuming the business is wound up in an orderly manner. This is not a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value;
- *liquidation*: this is a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value; or
- *going concern*: the net assets on a going concern basis estimates the market value of the net assets but does not take into account any realisation costs. This method is often considered appropriate for the valuation of an investment or property holding company. Adjustments may need to be made to the book value of assets and liabilities to reflect their going concern value.

The value of assets as a going concern is the most appropriate way to value the shares in Metallica Minerals as the company is continuing business in the foreseeable future.

6.3 Surplus assets

Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company. These are assets which, if sold, would not impact on the revenue or profit generating capacity of the entity. There are no surplus assets in Metallica.

6.4 Premium for Control

When valuing a controlling interest, an appropriate allowance should be made for the premium for control, given the strategic benefit that a controlling interest would provide. Empirical evidence on premiums for control indicates that these premiums tend to range between 15% and 40%. As we have applied a sum of parts valuation method which includes a discounted cash flow valuation of the flagship project CFSS, we have already valued the company on a controlling basis.

¹ Empirical Evidence of Control Premia:

CA ANZ Survey, September 2021: "For those using a standard control premium, the most common range adopted is 20-25%".

RSM Control Premium Study, 2021: "In the 15.5-year period ended 31 December 2020, the average implied 20-day pre-bid control premium for the Australian Market is 34.7%, whilst the median is 27.5%." The research also found premiums in the ranges of 9.5% to 40.6%.

Corporate Finance Institute, 2022: "Typically, control premiums can be in the 20%-30% range of the target's current share price and can sometimes go up to 70%".

Loneragan, Wayne, 'The Valuation of Businesses, Shares and Other Equity': "A typical control premium may be in the order of 25% to 40%".

Halligan & Co, Control Premium Research: "The median takeover premium on the 20-day pre-bid price is 30% based on our analysis of 605 takeovers over 14 years to FY2014".

6.5 Valuation of Cape Flattery Silica Sand Project (CFSS)

Metallica Minerals operates the Cape Flattery Silica Sand Project which has been valued through a discounted cash flow method as per the Definitive Feasibility Study announced in November 2023. SRK was engaged to provide advice to us in respect of certain aspects of the Definitive Feasibility Study DFS (refer to Appendix A) for a description of work that SRK was engaged to undertake. SRK did not identify any significant risks associated with mining. SRK suggests that the key risks are associated with the metallurgical recovery, shipping and product price received. Based on SRK's work, which indicated there was low risk in relation to operating costs and capital expenditure, we did not make any changes to the assumptions provided within the DFS cashflows.

The Definitive Feasibility Study outlines 49.5Mt of mineral resources with 38.1Mt of Silica sand sales across a 25-year life of mine. The average 2025 sales price in real terms is AUD\$80.54 per tonne. The life of mine revenue is forecast to be \$3,064.6m. The estimated initial construction capital expenditure is \$236.7m.

We were provided with the DCF used to value the project in the Definitive Feasibility Study, which involved a valuation of monthly cash flows adjusted for CPI. We have made the following adjustments to the DCF to value the company appropriately:

- Excluded the CPI effect to value the project cash flows.
- Annualised and mid-pointed the cash flows for timing purposes as projects may face changes in expected cash flows;
- The original DCF started in July 2025, as such, we have further discounted the cash flows to February 2024;
- Adjusted the discount rate based on the weighted average cost of capital (WACC) which can be seen in Appendix C.

As such, the cash flows that were used by AP to value this project were in nominal terms and were discounted with a nominal WACC.

Assessed Level of Dilution:

We note that the value of CFSS is based on the net present value of cash flows for the project and does not account for the risks and uncertainties regarding Metallica's ability to fund the initial construction capital expenditure.

The Definitive Feasibility Study estimated that the CFSS Project requires initial construction capex of \$236.7m. Argonaut Capital were engaged by Metallica Minerals management team to assist in raising debt capital to fund the initial capex of the CFSS mine. Metallica received a term sheet offer for \$100m at an interest rate of 12%. Metallica has not proceeded with the term sheet at this stage, however, the management team is undergoing discussions with this party, and various other debt providers to consider strategic options. To ensure commercial reality, AP has looked into the debt/equity mix of similar companies, which found that companies have similar capital structure and Metallica is aiming to raise a similar proportion of debt as the average.

Table 22: Debt/Equity mix of similar companies

Company Name	Market Data		Capital Structure
	Market Cap	Enterprise Value	Debt/Capital
Astron Corporation Limited (ASX:ATR)	94.98	112.56	19.24%
Atlas Lithium Corporation (NASDAQCM:ATLX)	330.21	320.12	52.32%
GEO JS Tech Group Corp. (OTCPK:GJST)	1.13	NA	38.60%
Kachchh Minerals Limited (BSE:531778)	3.18	3.14	32.45%
Mineral Commodities Ltd (ASX:MRC)	22.64	33.01	16.08%
Strandline Resources Limited (ASX:STA)	138.94	327.06	57.84%

Min	1.13	3.14	16.08%
Average	98.51	159.18	36.09%
Median	58.81	112.56	35.53%
Max	330.21	327.06	57.84%

There are a number of funding options that may be adopted by MLM. These may include:

- Share Issue – Metallica may opt to raise capital via a rights issue. However, due to the shares illiquidity and market cap of \$25m, this may be difficult to pursue. The company may be required to offer a discount to market to raise shares under this funding option.
- Joint Venture – The company may look to sell a portion of the CFSS Project to reduce funding requirements from MLM.

The level of dilution in MLM will be based upon the price at which the shares are raised. It is likely that shares would be issued in stages. Whilst it is not possible to predict the trading prices of Metallica, it is not unreasonable to assume that the share price would increase as shareholders gain confidence in the likelihood of successful funding of CFSS. As such, we believe that it is reasonable to assume the price offered on equity raises will increase as the company reaches milestones. We refer to the tables in Appendix G which outline the potential future dilution of Metallica shareholders to fund the CFSS Project. Based on our analysis in Appendix G, we consider it appropriate to discount the CFSS Project by 70% to account for risks and uncertainties regarding funding ability.

Table 23: Value of Cape Flattery Silica Sand Project

Value of Cape Flattery Silica Sand Project	
High Value of CFSS (13.44% WACC)	212,651,502
Low Value of CFSS (14.08% WACC)	195,810,055
High Value of CFSS (70% Discount)	63,795,451
Low Value of CFSS (70% Discount)	58,743,016

Source: AP Analysis

Table 24: Key Assumptions

Assumption Parameter	Unit	Value
Silica Price	USD/t	47.5
Exchange Rate	AUD:USD	0.75
Opex	A\$M	1,212
Capex	A\$M	107

Source: AP Analysis and Updated DFS for CFSS

The assumptions highlighted above were obtained from Metallica's updated DFS and were checked for reasonableness by SRK.

6.6 Sensitivity Analysis

The DCF valuation of Cape Flattery Silica Sand Project is based on numerous assumptions which are subject to uncertainty and variance. To provide a clearer understanding of our valuation to shareholders, we have completed a Sensitivity Analysis on the value of this project for both the high and low values.

The following variables have been adjusted in isolation, all other things held equal:

- A +/- 10% change in forecasted Silica Sand Price;
- A +/- 10% change in forecasted AUD:USD exchange rate;
- A +/- 10% change in Opex; and
- A +/- 10% change in Capex.

Users of this report must note that in reality, these variables above would have compounding and/or offsetting effects and are unlikely to move in isolation. These variables are not the only variables which are subject to deviation from the assumptions AP has made. Furthermore, the sensitivities do not cover the full

range of possible scenarios from the assumptions assumed, where variances can be greater or less than the percentage increase or decrease set out in this analysis.

The figures below highlight the impact of the variables on AP's valuation assessment of the Cape Flattery Silica Sand Project.

Figure 4: Sensitivity Analysis of Selected Key Assumptions for the DCF using WACC of 13.44%.

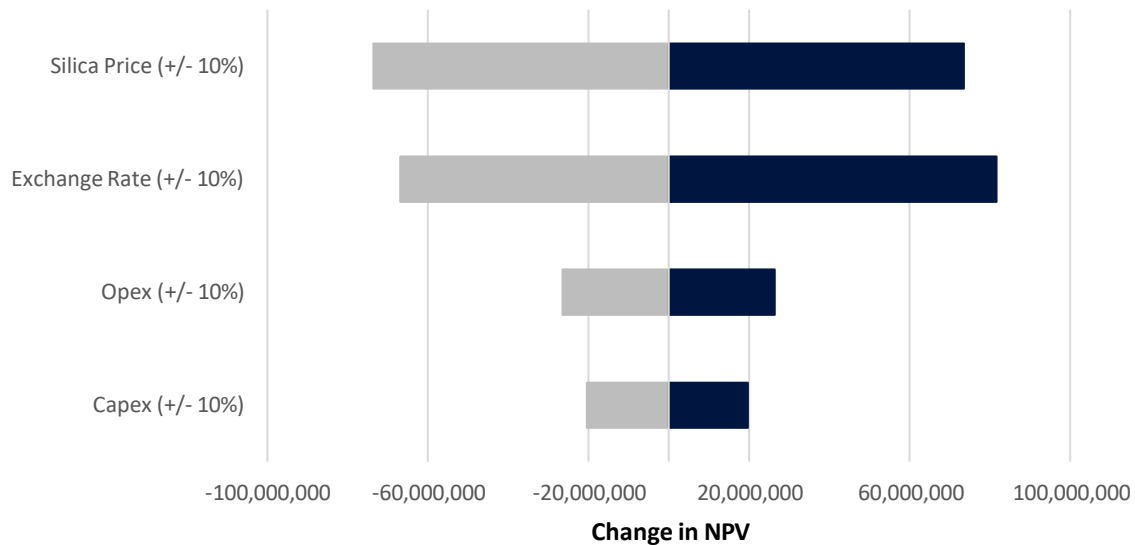
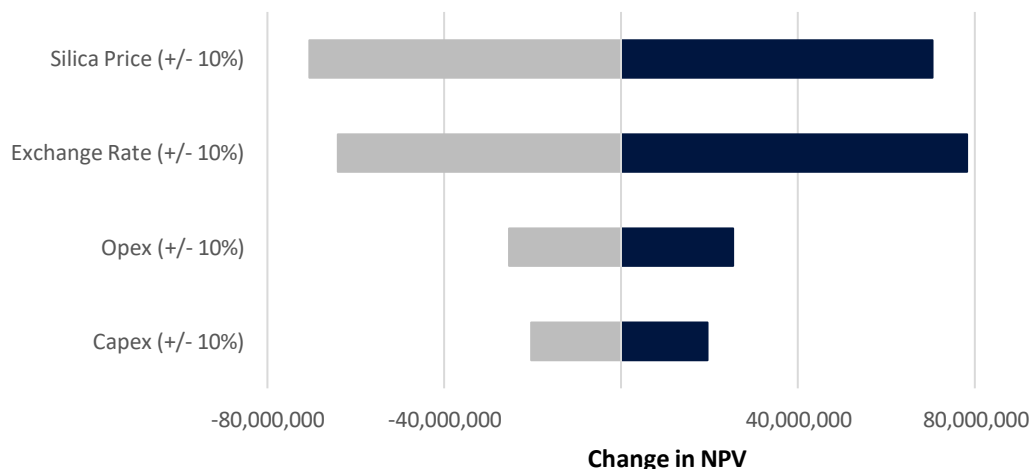


Figure 5: Sensitivity Analysis of Selected Key Assumptions for the DCF using WACC of 14.08%



6.7 VALMIN Disclosure

According to RG111.131, an expert is expected to have a VALMIN code report for valuing mining assets. However, RG 111.132 states that if this is not the case, it must be explained why this was not the case in the report. The reason AP was not able to obtain a VALMIN code report from an expert for valuing the mining assets was due to the limited timeframe provided to us. Although AP has attempted to engage various experts, the timeframe in which the report was to be prepared was too short, and hence limited our ability to obtain an expert's report which follows the VALMIN code.

Although a VALMIN report has not been prepared for the parties involved in this transaction, we believe that this report will assist security holders despite the limitations that AP cannot resolve. According to RG 111.126, the uncertainty is around the valuation methodology chosen to value projects that are not yet at

feasibility stage. AP has chosen to use a market based approach to these projects. The methodology chosen to screen these projects are further detailed in the report, and as such, we believe that the uncertainty would not have a significant impact on our opinion.

6.8 Valuation of Western Area of EPM 2574 at Cape Flattery

Metallica Minerals holds 12 Mt of Inferred Resources at the western end of the EPM 2574 which is not accounted for in the Definitive Feasibility Study and valuation. However, these resources have been reported in accordance with the JORC standards, as such, we've valued them based on an EV/Resource method using comparable silica sand mine multiples summarised below.

Table 25: Metallica Minerals' Western Cape Flattery Valuation

Value of Western Cape Flattery	
Silica Sands (mt)	12
EV/R Multiple	0.45
Value of Project	5.42

Source: AP Analysis

We've valued the resources in western Cape Flattery to be \$5.55m based on the comparable companies listed in the table below:

Table 26: Comparable companies summary

Company Name	Development Stage	Market Cap (AU\$M)	EV (AU\$M)	Total JORC Resource	Implied EV/Resource
Diatreme	Scoping Study	74.60	43.80	605.16	0.07x
Industrial Minerals Ltd	Exploration	16.50	15.40	12.40	1.24x
VRX Silica Limited	Feasibility Study completed	58.34	57.20	1,380.50	0.04x
Min		16.50	15.40	12.40	0.04x
Average		49.81	38.80	666.02	0.45x
Median		58.34	43.80	605.16	0.07x
Max		74.60	57.20	1,380.50	1.24x

Source: AP Analysis

6.9 Valuation of Clermont Copper Gold Project

Metallica Minerals holds 51% of the Clermont Copper Gold Project with Diatreme holding 49%. The project does not have any JORC resources or reserves. We were able to identify a comparable transaction which was the sale of the Nullagine Gold Project in December 2023 to Calidus Resources Limited. The project was sold for \$250,000 plus a further payment of \$5,000,000 based on reaching certain production targets. The tenement area is 533 square kilometers.

The Clermont project is 252.36 square kilometers in the same region. Metallica has paid \$1,000,000 for its 51% of the project as part of its farm in arrangement with Diatreme. On a per square kilometer basis when comparing with the Nullagine Project it represents a comparable value for 100-% of the Clermont project of \$2.48M. We have valued the 51% of Clermont project at the amount Metallica has paid for the 51% being \$1,020,000.

6.10 Value of Metallica

We have reviewed the assets of the company in the following table including the reviewed valuation of the company's Cape Flattery Silica Sand Project. We have accounted for other mining resources, net cash, and a control premium to determine the fair value of MLM on a controlling basis of \$70.01 to \$75.06.

Table 27: Metallica Minerals' Valuation Summary

Fair Value of MLM	Low	High
NPV of CFSS Project	58.74	63.80
Western Cape Flattery Resources	5.42	5.42
Clermont Project (51%)	1.02	1.02
Net Cash	4.82	4.82
Equity Value of MLM	70.01	75.06

Source: AP Analysis

This represents a per share value below:

Table 28: Metallica Minerals' Valuation on Controlling Basis

Fair Value of MLM on a minority basis	Low	High
Fair value of MLM	70.01	75.06
Shares Outstanding (inc. options)	991.92	991.92
Fair Value of MLM shares on a controlling basis	0.071	0.076

Source: AP Analysis

We have assessed the value of MLM based on the sum of parts method to be in the range of \$0.071 to \$0.076. This valuation is higher than the VWAP of MLM of \$0.0225 leading up to the takeover announcement. Our valuation may differ to the market due to the potential future capital raises to fund the Cape Flattery Silica Sand Project. These capital raises may dilute existing shareholders through the issuance of ordinary shares. The current shareholders of Metallica may discount the value of the stock on this basis. We have, however, considered a range of dilution scenarios and adjusted the value of the CFSS Project accordingly as per Section 6.5.

6.11 Share Valuation Cross Check

We have considered multiple valuation methodologies in assessing the value of Metallica Minerals. In this analysis, we have provided reasons why we have not proceeded with the following:

- Quoted Market Price – We have deemed this method as inappropriate due to the illiquidity of Metallica Mineral shares based on the analysis in section 5.10.
- Market Based Valuation – We have partially utilised a market-based valuation using EV/Resources in our primary valuation. Additionally, the valuation of CFSS on an EV/Resource basis would undervalue the resources considering the project has a Definitive Feasibility Study.
- Capitalisation of Future Maintainable Earnings – We have not adopted this valuation method as Metallica does not produce positive earnings.

We have considered all available valuation methods and have concluded that the most appropriate cross-check method is based on Metallica Minerals most recent capital raising in FY23. The company's capital raising history is detailed in section 5.12 of this report. The latest capital raising includes 145,000,000 shares at \$0.0335.

Table 29: Metallica Minerals' Valuation Cross Check

Fair Value of MLM on a minority basis (cross-check)	
Capital Raise Price of MLM	0.0335
Shares Outstanding	959.92
Fair Value of MLM	32.16
Control Premium	30%
Fair Value of MLM on a controlling basis	41.805

Source: AP Analysis

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We have assessed the value of Metallica Minerals based on the VWAP of the November 2022 capital raising at \$0.0335 per share. Based on this valuation method, the fair value of MLM on a controlling basis is \$41.805m. We note there is a significant discount between the cross-check and the primary valuation and have provided reasoning to this discount:

- The placement was pre-feasibility and did not reflect the economic viability of the CFSS resources.
- Shareholders may differ in opinion regarding the debt and equity mix required to fund the CFSS Project, particularly given there was no estimate of initial capex to fund the project as provided by the DFS.

6.12 Difference to Market Price

According to RG 111.82, an Independent Expert is required to comment on the material difference between the market share price and the expert's valuation. In AP's opinion, the following reasons explain the reason for this material difference:

- Metallica is a thinly traded stock: According to RG 111.86, there are certain methodologies considered appropriate. RG 111.86(d) discusses the quoted price for listed securities when there is a liquid and active market as an appropriate methodology. As Metallica's shares do not meet this criterion, AP believes that this is a possible description for the material difference in valuation.
- As the company is thinly traded it is likely that there is a liquidity discount on the current share price
- There is a control premium implicit in the valuation methodology which isn't reflected in the market price.
- In the CFS region, Metallica's project is the most developed after Mitsubishi, which gives the company a first mover advantage and is not yet realised by the market.
- The company had not disclosed its fund raising endeavors and as a result may have been discounted due the market not having this information.
- As a small cap company there is low share market visibility and not many investors are aware of Metallica due to its operations within a niche market. Market value reflects supply and demand in the current market and related market sentiment with regard to the future prospects of the company. The company is a small market cap company so limited coverage leading to limited investor attention

Table 30: Valuation to Share Price

Percentage to Share Price - Share Price Day before Offer	Low	High
Metallica Percentage to Share Price	173%	292%
Diatreme Percentage to Share Price	100%	152%

Source: AP Analysis

7.0 Diatreme Resources Ltd

7.1 Company overview

Diatreme Resources Limited is an emerging Australian producer of mineral and silica sand based in Brisbane. The company has four key projects, with two focused on silica sand. Diatreme also has a Copper-Gold Project, which is subject to a farm-out with Metallica Minerals (ASX: MLM). The company also has a Zircon- rich project, which is considered one of a handful of major zircon-rich discoveries in the past decade. This project is well-positioned for development, sale, or joint venture.

Diatreme has an experienced Board and management across all stages of exploration, mine development and financing coupled with strong community engagement skills. The company has resources which play a role in the global decarbonisation and ongoing conversion of power generation to renewable energy sources. Further, the company has a strong focus on ESG, working with Traditional Owners to ensure long-term sustainability including health, safer and environmental stewardship.

Figure 6: Map of Diatreme's Operations



Source: Diatreme Annual Report

7.2 Projects

The table below highlights the key projects and their descriptions.

Table 31: Diatreme Projects Summary

Project	Description	Stage of Development
Northern Silica	Diatreme Resources' Northern Silica Project is a silica sand mining project in early stages. The site is situated in the Hope Vale Aboriginal Shire near Cape Flattery, Far North Queensland and in close proximity to the Cape Flattery Silica Mines and the Cape Flattery Port.	Exploration Stage: Completed a Scoping Study. Has not completed a Pre-Feasibility Study (PFS) or a Definitive Feasibility Study (DFS). The Scoping Study has provided Indicated and Inferred Resources and does not provide probable or proven ores in their JORC summary.
Galalar	The Galalar project is located near the world's largest silica sand mine in North Queensland. Diatreme's Galalar Silica Project is capable of producing high quality silica for the Asian solar panel market.	Exploration Stage: A DFS was in process until the Northern Silica Project was identified and developed. This project has now been paused until the company's Northern Silica Project is further developed.
Cyclone	Diatreme's Cyclone Zircon Project in Western Australia's Eucla Basin is considered the largest undeveloped high-grade zircon project in the Basin	Early Development: Completed a DFS, and Diatreme is looking to raise capital through development partners for this project.

Clermont	The Clermont Copper/Gold Project is situated in the town of Clermont in central Queensland. The project is prospective for porphyry and strata bound bulk tonnage copper/gold deposits along with mesothermal gold deposits.	Exploration: Drilling programs results were released, with JV partner (Metallica Minerals) now owning a 51% ownership of this project. Further drilling programs are expected to continue.
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Source: AP Analysis

The Northern Silica Project and Galalar Project are owned by Cape Silica Holdings Pty Ltd, in which Diatreme has entered into a joint venture with their second largest shareholder, Sibelco. Diatreme currently has a 73.2% share in Cape Silica Holdings Pty Ltd.

Although the Galalar Project has probable reserves, Diatreme has publicly announced that their efforts were to focus on developing the Northern Silica Project and therefore, have stopped developing the Galalar project. Moreover, in July 2023, Diatreme formally withdrew its application to prepare an EIS for Galalar.

7.3 Diatreme Resources JORC Ore Reserves and Mineral Resources

Diatreme's Ore Reserves and Mineral Reserves are summarised below in accordance with the JORC (2012) Code.

Table 32: Summary of Heavy Minerals (HM) Ore Reserves and Mineral Resources

Project	Ore Reserve Category	Ore Tonnes Millions	HM Grade (%)
Cyclone	Probable	138	2.60

Project	Mineral Resource Category	Mineral Tonnes Millions	HM Grade (%)
Cyclone	Measured	156	2.40
	Indicated	48	1.90
	Total	203	2.30

Source: AP Analysis and Diatreme's 2023 Annual Report

Table 33: Summary of Silica Sand Ore Reserves and Mineral Resources

Project	Ore Reserve Category	Ore Tonnes Millions	SiO2 Grade %
Galalar	Probable	32.53	99.2

Project	Mineral Resource Category	Material Tonnes Millions	SiO2 Grade %
Galalar	Measured	43.12	99.21
	Indicated	23.12	99.16
	Inferred	9.22	99.10
	Total	75.46	99.18
NSP	Measured	49.5	99.33
	Indicated	120.50	99.31
	Inferred	65.00	99.27
	Total	235.00	99.29
WRA	Indicated	10.3	99.2
	Inferred	81.4	99.38
	Total	91.7	99.36
Total	Measured	92.62	99.21
	Indicated	153.92	99.16
	Inferred	155.62	99.31
	Total	402.16	99.26

Source: AP Analysis and Diatreme Annual Report

As can be seen from the JORC tables, only two of Diatreme's projects, Cyclone and Galalar have reserves. Diatreme's Northern Silica only has mineral resources and Clermont is in the early drilling stage and there

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has not been any identification of Mineral Resources according to the JORC Code.

7.4 Key Personnel

The Executives and Directors of Diatreme are detailed in the table below.

Table 33: Executives of Diatreme Resources Limited

Name & Position	Description
Neil John McIntyre Chief Executive Officer	Neil J. McIntyre has led Diatreme Resources Limited as CEO since August 26, 2014, bringing over 25 years of senior management experience. Formerly Managing Director of Pacific Capital Limited, his expertise in mining and petroleum sectors, coupled with roles in origination and financing, solidifies his prominence in the industry. McIntyre's contributions extend to various listed and unlisted exploration companies.
Tuan Quy Do CFO, Financial Controller & Company Secretary	Tuan Quy Do, BComm., CA, has been the Company Secretary of Diatreme Resources Limited since May 26, 2011, concurrently holding the positions of Financial Controller and Chief Financial Officer. With over 20 years of experience in senior finance roles for public companies in Australia and New Zealand, Mr. Do's expertise contributes significantly to the company's financial management.
Neil MacKenzie-Forbes Chief Geologist	Mr. Neil Mackenzie-Forbes serves as a Chief Geologist at Diatreme Resources Limited. He served as a General Manager of Columboola Joint Venture of Metrocoal Ltd., from December 14, 2011 to September 30, 2013. Mr. Mackenzie-Forbes served as an Exploration Manager of Metrocoal Ltd. from July 1, 2008 to December 14, 2011. Mr. Mackenzie-Forbes graduated from the Queensland University of Technology with a Bachelor of Applied Science in 1993.
Wayne Swan Chairman of the Board	Wayne Swan, BA Hons, is the Independent Non-Executive Director & Chairman of Diatreme Resources Limited since November 2021. Formerly Australia's Treasurer, he received the Euromoney Finance Minister of the Year award in 2011 and is actively involved in international commissions on inclusive prosperity and corporate taxation. Swan is also the President of the Australian Labor Party.
Michael John "Mike" Chapman Director	Michael John Chapman, also known as Mike, is an Independent Non-Executive Director at White Energy Company Limited since June 01, 2023, and a Non-Executive Director of Diatreme Resources Limited since August 1, 2020. He previously served as Chief Operating Officer at White Energy Company Limited from July 19, 2010, to August 31, 2019, and held a similar role at Yancoal Resources Limited from July 1, 2007. With expertise in the development and management of mining projects, Mr. Chapman brings valuable experience to his roles.
Kara Keys Director	Ms. Kara Keys joined Diatreme Resources Limited as a Non-Executive Director on July 19, 2023, bringing a robust background in finance and board leadership. With prior roles at Cbus Super, Powerlink, and United Super Asset Management, she has a strong financial foundation. Additionally, Ms. Keys has been actively involved in advocacy, serving as the chair of Women in Super and contributing to Indigenous communities through her work at the Australian Council of Trade Unions.

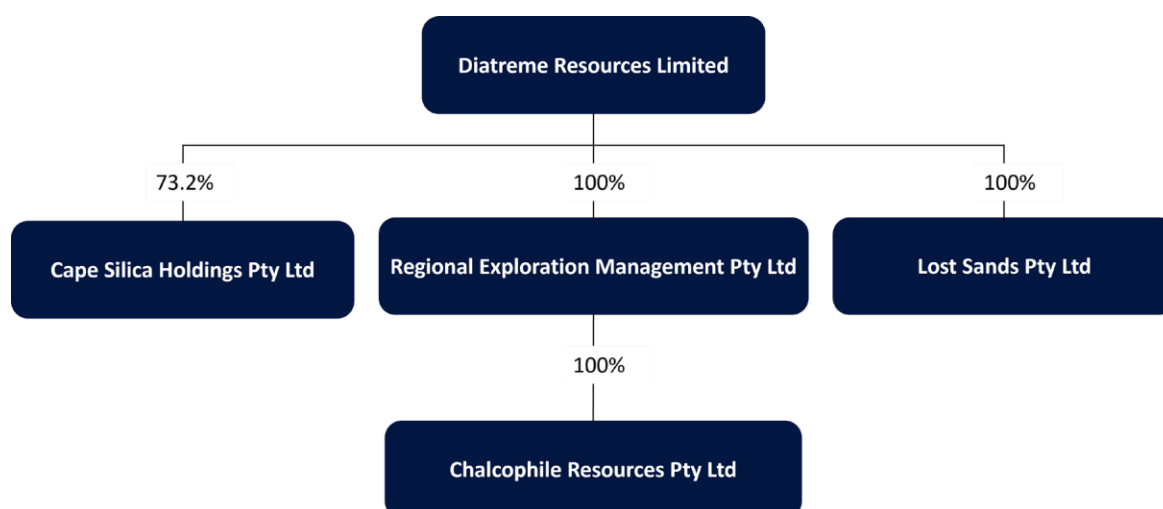
Gregory Barry Starr Director	Mr. Gregory Barry Starr, known as Greg, holds key positions in the corporate sector. Serving as Managing Director, Company Secretary, and CFO of AHP Group Limited, he has directed Candy Club Holdings Limited and serves as Company Secretary at Investor Centre Limited. With executive roles at KBL Mining Limited and memberships in the Australian Institute of Company Directors, he brings extensive experience to various ASX-listed companies, including Admiralty Resources NL and Smart Auto Australia Limited.
Cheng "William" Wang Director	Mr. Cheng Wang, also known as William, is the Director of Investment Banking at AIMS Financial Group and a founding Director of Gulf Alumina Pty. Ltd. With senior management experience in major Chinese state-owned companies like China Poly Group, he has significant business connections in China. Serving as a Non-Executive Director of Diatreme Resources Limited since May 27, 2011, Mr. Wang holds an MBA in finance from the Chinese University of Hong Kong.

Source: Capital IQ

7.5 Ownership and Capital Structure

Diatreme has the following subsidiaries:

Figure 7: Diatreme's Corporate Structure



Source: Capital IQ and AP Analysis

Note: Sibelco has recently completed two tranche investments with Cape Silica Holdings Pty Ltd, yielding a 26.8% Joint Venture. This means that the projects held under Cape Silica Holdings result in 73.2% attributable to Diatreme Resources.

As at 31st of December 2023, Diatreme Resources' top 10 shareholders and total issued ordinary shares are summarised in the table below.

Table 35: Top 10 Shareholders as at 31st of December 2023

As of 31st December 2023		
Pre-Takeover DRX Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital
Ilwella Pty. Ltd.	784,677,120	21.04%
SCR-Sibelco N.V.	742,513,428	19.91%
DELPHI Unternehmensberatung AG	341,307,138	9.15%
Yufeng Zhuang	151,841,819	4.07%
2invest AG	130,434,783	3.50%

Chenfei Zhuang	91,900,000	2.46%
Jie Wu	87,171,308	2.34%
Chenxia Zhou	62,500,000	1.68%
VW Pty Ltd	61,000,001	1.64%
Andrew Tsang	53,177,747	1.43%
Top 10 Shareholders	2,506,523,344	67.20%
Other Shareholders	1,223,235,782	32.80%
Total Issued Shares	3,729,759,126	100.00%
Outstanding Options & Performance Rights	66,666,667	
Total Diluted Shares	3,796,425,793	

Source: Capital IQ and AP Analysis

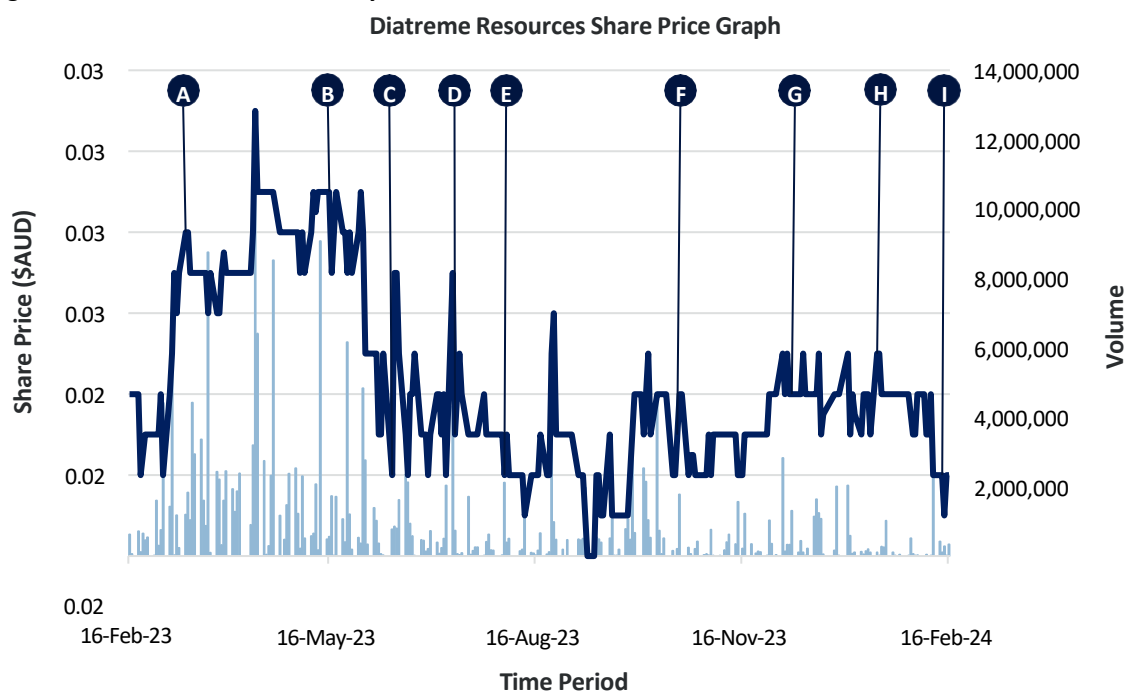
7.6 Share Price Analysis

In order to assess the reliability of using the traded market price of DRX's shares as a basis for determining the fair market value of the shares in DRX we have had regard to:

- the liquidity of the stock over the trading period;
- the 'spread' of ordinary shareholders and the total number of ordinary shares that they hold in the Company, considering any trading or other restrictions applicable to the quoted ordinary shares;
- the level of trading activity of the quoted ordinary shares in the Company (i.e. the volume of trades of the quoted ordinary shares in the market as a percentage of the total quoted ordinary shares, and the frequency of the trades);
- the number and frequency of 'unusual' and/or 'abnormal' trading that takes place in the Company's quoted ordinary shares;
- the presence of any factors that may indicate that trading in the shares is the result of significant speculative trading; and
- the level of knowledge that the 'willing' buyers and sellers have in respect of the Company and the market in which it operates.

We have analysed Diatreme's daily share close price and volume traded during the period from 16th of February 2023 to 16th of February 2024.

Figure 8: Diatreme Share Price Analysis



 Diatreme Resources Limited (ASX:DRX) - Volume

 Diatreme Resources Limited (ASX:DRX) - Share Pricing

Notable events disclosed by Diatreme's company announcements during the trading period which may have impacted Diatreme's share price movements and trading volumes are set out as follows:

Table 36: Diatreme's Recent Company Announcements

Date	Event	Description
13-Mar-23	A	Major Silica Resource Expansion
19-May-23	B	Permitting Pathway advances for NSP
14-Jun-23	C	Scoping Study for NSP
13-Jul-23	D	Offtake MOU for NSP
03-Aug-23	E	NSP granted Regional Significance Status
17-Oct-23	F	Sibelco 2nd Tranche Investment
06-Dec-23	G	Resources found near NSP
15-Jan-24	H	Diatreme NSP declared a Coordinated Project
16-Feb-24	I	Conditional intention to make a takeover bid for MLM

Source: Capital IQ

The following tables outline Diatreme's trading data. The past 12-months of trading data was used to determine daily turnover and monthly volumes. Typically, the large sophisticated and founding shareholders of small-cap companies are not traders of their shares.

Table 37: Diatreme's Share Overview

Company	Ticker	Shares Outstanding	Free Float
Diatreme Resources Limited	ASX:DRX	3,729,759,126	1,125,940,493

Source: Capital IQ

The following table is a summary of Diatreme's 12-month trading data including average daily volume, low price, high price, and closing price.

Table 38: Diatreme's Trading Data

ASX:DRX	Avg Volume	Share Pricing		
		Low (\$AUD)	High (\$AUD)	Close (\$AUD)
Month Ended				
Mar-23	2,189,076	0.022	0.028	0.027
Apr-23	2,904,536	0.027	0.031	0.028
May-23	1,672,351	0.027	0.029	0.028
Jun-23	850,125	0.022	0.027	0.023
Jul-23	606,599	0.022	0.027	0.023
Aug-23	618,056	0.021	0.026	0.023
Sep-23	692,890	0.020	0.024	0.024
Oct-23	895,300	0.022	0.025	0.022
Nov-23	405,804	0.022	0.024	0.024
Dec-23	686,438	0.023	0.025	0.024
Jan-24	284,285	0.023	0.025	0.023
Feb-24	514,326	0.021	0.024	0.023

Source: Capital IQ & AP Analysis

Given the above data, we note the following regarding DRX's trading data:

- the share price peaked at \$0.031 in April 2023 and reached a low of \$0.020 in September 2023.
- average daily volumes ranged from 284,285 in January 2024 to 2,904,536 in Apr 2023.

7.7 Liquidity Analysis

The following table displays the volume for each month in the past year, as well as the percentage of total and free float shares for each given month.

Table 39: Diatreme's Liquidity Analysis

Month	Volume Traded	Vol. Traded as % of Total Shares	Vol. Traded as % of Free Float Shares
Feb-24	9,990,525	0.27%	0.89%
Jan-24	11,768,841	0.32%	1.05%

Dec-23	14,822,520	0.40%	1.32%
Nov-23	10,075,778	0.27%	0.89%
Oct-23	18,529,025	0.50%	1.65%
Sep-23	20,032,470	0.54%	1.78%
Aug-23	16,435,796	0.44%	1.46%
Jul-23	16,979,237	0.46%	1.51%
Jun-23	24,234,727	0.65%	2.15%
May-23	45,694,710	1.23%	4.06%
Apr-23	70,653,845	1.89%	6.28%
Mar-23	61,046,491	1.64%	5.42%
Minimum	9,990,525	0.27%	0.89%
Average	26,688,664	0.72%	2.37%
Median	17,754,131	0.48%	1.58%
Maximum	70,653,845	1.89%	6.28%

Source: Capital IQ and AP Analysis

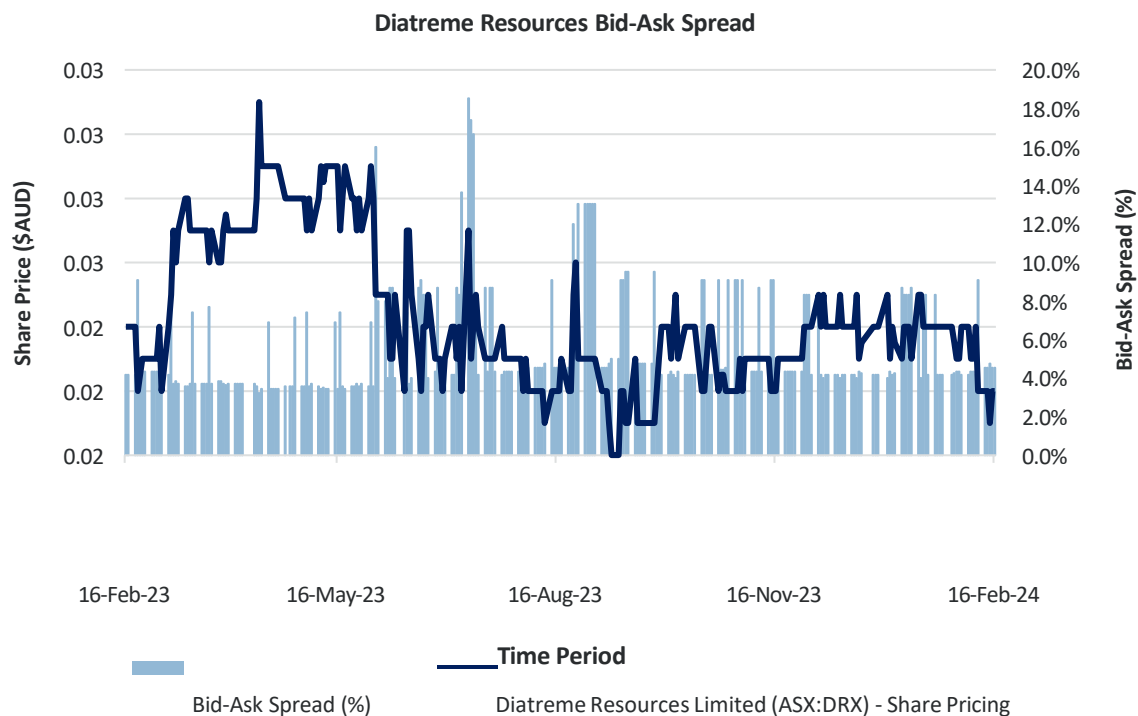
We note the following regarding DRX's volume and liquidity data from March 2023 to Feb 2024:

- the cumulative volume traded of total shares is 8.6% over this period.
- the cumulative volume traded of free float shares is 28.4%.
- monthly volumes ranged from 9,990,525 in February 2024 to 70,653,845 in April 2023.

In accordance with RG 111.86(d), an expert can use the quoted price for a listed security as an appropriate method of valuation, when there is a liquid and active market. Since Advisory Partner identified that less than 10% of trading volume occurred each month over the past year, this method is not considered appropriate.

We have analysed the bid and ask spread in trading data for the previous 12-months. The below chart demonstrates the bid and ask spread from 16th of February 2023 to 16th of February 2024.

Figure 9: Diatreme Bid/Ask Spread



Source: Capital IQ and AP Analysis

In regard to the data provided above, we note the following:

- the minimum spread is 3.23%

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- the median spread is 4.35%

- the average spread is 5.61%
- the maximum spread is 18.52%

For a stock to be thinly traded, the stock must have a low volume of trades and also a large bid-ask spread. However, the spread percentage was minimal as the share price difference between the bid and ask prices was one-thousandth of a cent. Therefore, from our analysis, we have determined that Diatreme's shares are thinly traded. As such, we have not used the share price as our primary valuation method.

7.8 Volume Weighted Average Price

We have reviewed the following factors relating to the trading activity of Diatreme's shares on the ASX:

- the daily high, low and closing share price of trades of Diatreme;
- the daily volume of DRX's share trading; and
- the volume weighted average share price ("VWAP") of DRX.

Table 40: Diatreme's VWAP

Diatreme VWAP	Low	High	VWAP
Up to 16th February 2024			
1 Day	0.0200	0.0310	0.0220
5 Day	0.0211	0.0303	0.0222
10 Day	0.0214	0.0297	0.0223
1 Month	0.0217	0.0293	0.0229
2 Month	0.0227	0.0287	0.0237
3 Month	0.0229	0.0280	0.0238

Source: Capital IQ & AP Analysis

We note the following regarding with respect to the share price of MLM in the 3-months leading up to the takeover intention announcement.

- The VWAP ranges from \$0.0220 (1-day) to \$0.0238 (3-month)
- The average VWAP across this range is \$0.0228.
- From Advisory Partner's analysis, Diatreme's VWAP has been trading below Metallica's VWAP.

7.9 Historical Profit and Loss

We detail below the past 3 years Profit and Loss for Diatreme.

Table 41: Diatreme's Historical Profit and Loss

Income Statement (000's)	Actual		
	CY21	CY22	CY23
Revenue	24	110	456
Other Income	-	8,282	13,848
Total Income	24	8,392	14,304
Expenses			
Employee Benefits	(858)	(1,204)	(1,164)
Exploration expenditure written off	(17)	-	(21)
Share based payment expense	(199)	(339)	(458)
Other Expenses	(887)	(1,578)	(1,951)
Total Expenses	(1,962)	(3,121)	(3,594)
EBITDA	(1,938)	5,271	10,710
Depreciation Expense	(101)	(171)	(214)
EBIT	(2,039)	5,099	10,496
Interest	(111)	(121)	(130)
Pre Tax Income	(2,150)	4,978	10,366
Income Tax	-	-	-
Net Profit	(2,150)	4,978	10,366

Source: Diatreme Annual Reports

7.10 Historical Balance Sheet

We detail below the historical balance sheet for Diatreme as at 31 December 2020, 2021 and 2023.

Table 42: Diatreme's Historical and Current Balance Sheet

Balance Sheet (000's)	Actual		
	CY21	CY22	CY23
ASSETS			
Current Assets			
Cash and Cash Equivalents	6,500	13,641	10,772
Trade and Other Receivables	161	563	314
Total Current Assets	6,662	14,204	11,086
Non-Current Assets			
Investment in joint venture	-	25,117	38,948
Property, Plant and Equipment	254	581	694
Right-of-use Assets	88	29	216
Exploration and evaluation of assets	26,095	15,364	15,540
Other Assets	38	38	47
Total Non-Current Assets	26,474	41,130	55,446
Total Assets	33,136	55,334	66,532
LIABILITIES			
Current Liabilities			
Trade and Other Payables	713	967	1,044

Borrowings	1,518	-	1,525
Lease Liabilities	58	32	96
Provisions	8	9	103
Total Current Liabilities	2,297	1,008	2,768
Non-Current Liabilities			
Borrowings	-	1,509	-
Lease Liabilities	32	-	125
Provisions	46	70	68
Total Non-Current Liabilities	78	1,580	193
Total Liabilities	2,375	2,588	2,961
Net Assets	30,761	52,746	63,571
Equity			
Issued Capital	76,965	93,638	93,638
Reserves	225	559	1,017
Accumulated Losses	(46,429)	(41,450)	(31,084)
Total Equity	30,761	52,746	63,571

Source: Diatreme Annual Reports

7.11 Historical Cash Flow Statement

We detail below the historical Cash Flow Statement for Diatreme as at 31 December 2020, 2021 and 2022.

Table 43: Diatreme Historical Cash Flow Statement

Cash Flow Statement (000's)	CY21	Actual CY22	CY23
Cash from Operating Activities			
Receipts in course of operations	15	17	8
Payments to suppliers and employees	(1,978)	(2,427)	(2,645)
Interest received	9	26	420
Government grants & Incentives	-	-	-
Finance Costs	(193)	(124)	(103)
Net Cash from Operating Activities	(2,147)	(2,508)	(2,320)
Cash From Investing Activities			
Payments for Property, Plant and Equipment	(203)	(480)	(290)
Payments for Exploration and Evaluation assets	(6,349)	(6,583)	(194)
Proceeds from sale of Property, Plant and Equipment	-	108	30
Proceeds from sale of investments	-	-	-
Payments for security deposits	(18)	-	(9)
Net Cash used by Investing Activities	(6,569)	(6,955)	(462)
Cash From Financing Activities			
Proceeds from issue of shares	10,130	17,756	-
Payments for share issue costs	(639)	(1,089)	-
Repayment of Lease Liabilities	(62)	(63)	(86)
Net Cash from Financing Activities	9,429	16,604	(86)
Net Increase / (Decrease) in cash & cash equiv.	712	7,141	(2,868)
Cash and Cash equiv. at beginning of year	5,788	6,500	13,641
Cash and Cash equiv. at end of year	6,500	13,641	10,772

Source: Diatreme Annual Reports

8.0 Valuation of Diatreme's Shares

To arrive at an appropriate valuation of Diatreme's Shares, we have considered various methods as set out in Appendix 2. From our analysis, the most appropriate valuation method applicable is the EV/Resources multiple.

We have based our assessment of EV/Resources on:

- Summary of Diatreme Resources proposed Northern Silica Project Report by Cowie Environmental Services;
- An infrastructure review commissioned by Advisory Partner done by PAEMAC (Appendix D);
- Previous audited annual reports;
- Diatreme's Scoping Study for Northern Silica Project; and
- Any other publicly available information regarding Diatreme's projects.

8.1 Scoping Study

On 14 June 2023, Diatreme announced a 'Positive Scoping Study for Northern Silica Project' which highlighted the proposed operations of the overall Northern Silica Project. Diatreme completed this study with assistance from Ausrocks. In this study, Diatreme estimates a mine life of 25 years with a target production rate of 3Mtpa in the first two years and moving to 5 Mtpa in Phase 2. The study highlights the viability of producing and exporting Silica Sand. The Scoping Study states that it is based on 100% ownership of Cape Silica Holdings Pty Ltd, however this is not the case. Sibelco, Diatreme's second largest shareholder also entered into a joint venture of 26.8%, which implies that Diatreme's ownership of the Northern Silica Project and the Galalar project is 73.2%. This has been accounted for in Advisory Partner's valuation of Diatreme's shares. Furthermore, the Northern Silica Project has no reserves, and only JORC Resources have been identified. NSP's JORC Resources are categorised as Indicated and Inferred, suggesting a lower level of geological knowledge and confidence and does not consider any Modifying Factors.

8.2 Infrastructure

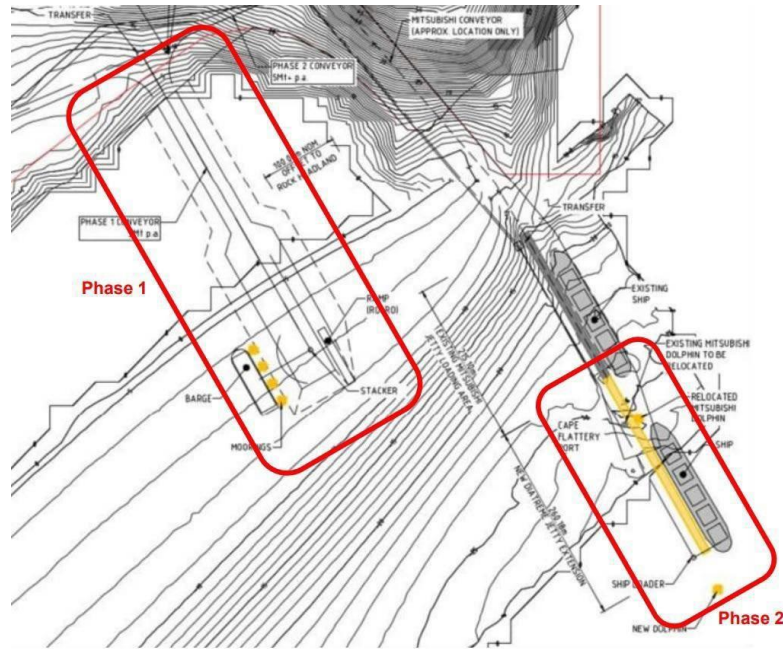
At present, Diatreme's mining and exploration area does not have any infrastructure they can use to generate cash flow. The scoping study highlights key details of the port and site infrastructure that requires development.

Port Infrastructure

To export the material, Diatreme has identified that Ports North Cape Flattery is the most economically viable method. The study highlights two development phases, where Phase 1 involves the construction of a rock wharf to the west of Mitsubishi's existing jetty that is equipped with a conveyor and shiploader system outloading onto 8,500t transshipment barges with an outloading capacity of 3Mtpa. Diatreme's rock wharf is expected to include a concrete roll on-roll off facility.

Phase 2 is an extension of Mitsubishi's jetty to allow for 55,000t bulk carriers to moor directly onto the jetty and be loaded by shiploader. Diatreme expects this to have an outloading capacity of 5 Mtpa. The wharf extension is to be constructed 3 years after the construction of the rock wharf. The figure below outlines the planned infrastructure.

Figure 10: Diatreme's Port Infrastructure Proposal



Source: PAEMAC's Port Infrastructure Report

According to the PAEMAC Report (Appendix D), there are various site constraints during the construction process for the port infrastructure. These include road access, water depth, tidal range, and adverse weather conditions such as Cyclones. These are further explained in the table below.

Table 44: Port Infrastructure Constraints

Constraint	Explanation
Access	Road access to the site is limited to a 4x4 track. It is expected that all material delivery will be through water, with marine plant being mobilised from Cairns or Townsville. Land-side plant for construction of the rock wharf will also need to be mobilised via water and a temporary facility will need to be constructed for the delivery of earthmoving equipment.
Water Depth	Depth at outermost tip of rock wharf is 8m at Lowest Astronomical Tide (LAT)
Tidal Range	Maximum tidal range is 3m, with 95% daily variation falling between 0.34m and 2.57m above LAT
Cyclone and Weather	The site is located in the Eastern Cyclone Zone, with Cyclones typically running from November to April. Provision of Cyclone moorings for all marine construction plant on site would be required. Further, previous project experience under these conditions suggest a 15% weather loss to be expected.

Source: PAEMAC's Port Infrastructure Report

To facilitate the construction of Diatreme's wharf extension during Phase 2, the existing mooring dolphin which assists Mitsubishi's current operations will need to be relocated in order to not disturb their operations. However, due to the location of Diatreme's wharf extension, the new dolphin will still be impacted by shipping operations. This will require the periodic relocation of the Self-Elevating Modular Platform (SEMP) to accommodate the passage of vessels for Mitsubishi's operations.

According to PAEMAC's estimate, the overall estimate for the cost of constructing Diatreme's proposed rock wharf is \$160.3 million while Phase 2 wharf construction is estimated to cost \$236.2 million. These estimates include direct costs, indirect costs, and any contingency provisions. These PAEMAC estimates of the marine infrastructure capital total \$396.5m which is higher than the estimated capital costs disclosed in Diatreme's Scoping Study for Off Site Infrastructure, being \$175.9m. The PAEMAC Report is detailed in Appendix D.

PAEMAC's report also highlights some key interaction issues with the existing port infrastructure and CFMS Operations. Due to Mitsubishi's operations existing in close proximity, interaction issues are unavoidable and involve the risks detailed in the table below.

Table 45: Port Infrastructure Interaction Issues

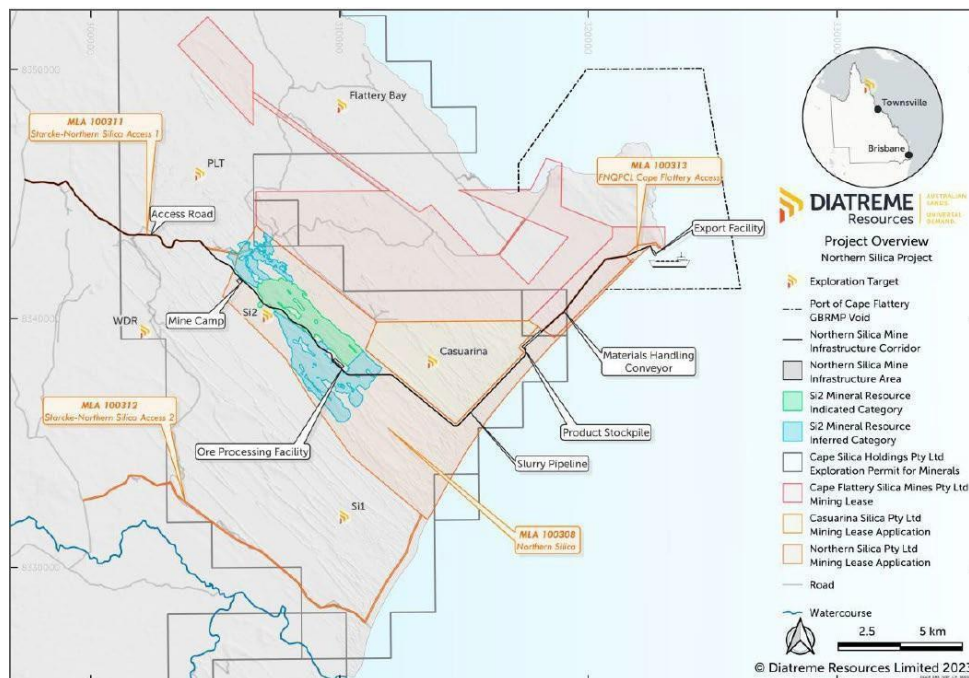
Interaction Issues	Explanation
Phase 1 transshipping	Key risks include interaction/coordination with existing operations and management of shipping operations, operational capacity of transshipping vessels and rate of outloading operations, weather, and capacity of existing dolphins to accommodate simultaneous mooring of bulk- and transshipment-vessels.
Phase 2 Construction	The existing Port of Cape Flattery approach and lack of tugs available means construction area of Phase 2 extension is in the path of incoming vessels. This would mean that all construction activities would need to be coordinated with shipping schedule.
Port Operations post Phase 2 construction	Due to the proximity of both berths, a re-evaluation of current port approach and mooring strategy is required.
Removal/Relocation of Existing Mooring Dolphin	The current existing dolphin is in the path of the construction area and will need to be relocated during the construction phase to reduce impact on current operations.
Safety Issues for Workers	Some key workplace safety considerations include any parting mooring lines that may snap-back.

Source: PAEMAC's Port Infrastructure Report

Site Infrastructure

In regard to the site infrastructure, the study details that site infrastructure will cover approximately 10ha of the Mining Lease and is planned to accommodate roads, parking, mine offices etc which aid in the function of the overall site, while also creating specific areas for non-process areas, such as the Accommodation Village, Water Services and Electrical Services.

Figure 11: Diatreme Project Overview



Source: Diatreme NSP Scoping Study

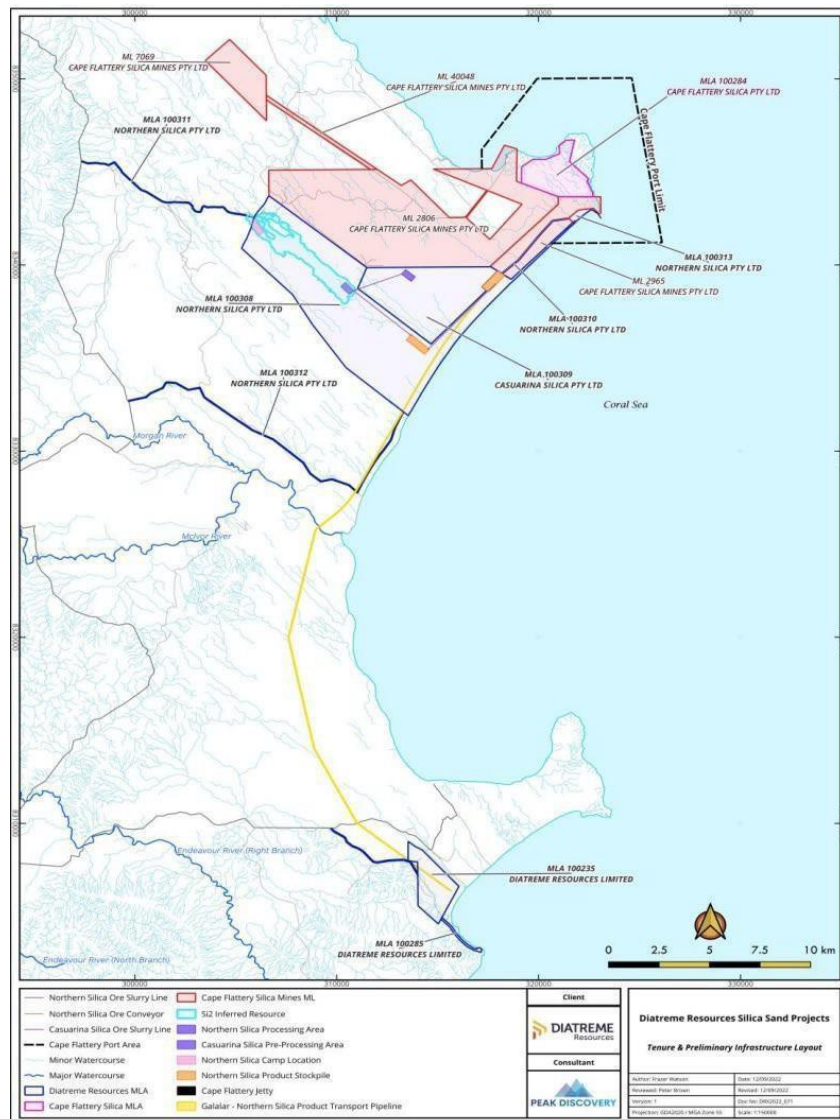
Altogether, the Scoping Study provides the capital cost estimate of \$355.6 million when operating at 3 Mtpa and \$534.8 million at 5 Mtpa. This estimate includes all direct (process and non-process infrastructure), indirect costs, contingencies, and other allowances. The estimates for marine infrastructure in Diatreme's scoping study are lower compared to PAEMAC's report. This is because the capital costs in the scoping study outline the total capital cost for the project, while PAEMAC is specific only to the Port Infrastructure.

8.3 Environmental Issues

The Northern Silica Project will trigger a requirement for an Environmental Impact Statement (EIS). Diatreme was recently declared a Coordinated Project. This provides an EIS pathway that supports both an Environmental Authority (EA) and a Controlled Activity Approval. Along with this, it will facilitate any associated permitting requirements that would otherwise be outside the assessment pathways of these approvals such as infrastructure access, maritime infrastructure arrangements and water allocations. The EIS process requires the collection of long-term data and modelling exercises with focus on water allocation, aquatic and terrestrial ecology, marine and coastal environment, soils, and cultural heritage. This will require various plans and analyses to be made such as the Social Impact Assessment.

Diatreme's ASX announcement on 21 October 2022 highlighted a new export option for their Galalar Project. The company plans to build a small diameter (300-500mm) pipeline through its current exploration tenure area EPM 17795 from the Galalar Mine Site to the designated Port area of Cape Flattery as shown below.

Figure 12: Diatreme's Slurry Pipeline Proposal



Source: Diatreme's 'Further export optionality identified for Galalar Project' Announcement

The new export option on the ASX announcement does not outline any costs associated with this option. However, this would require Diatreme to lodge infrastructure applications to the local government, further creating potential for environmental issues for the Galalar project, which has recently withdrawn its application for developing its EIS in 2023.

8.4 Forward Looking Statements

According to ASIC, forward looking statements such as production targets are inappropriate to state unless there are reasonable grounds to do so. The industry standard for reasonable grounds is the JORC Classification. More specifically, ASIC in accordance with Information Sheet 214 highlights that a correctly estimated ore reserve will be sufficient to establish reasonable grounds for a production target.

For Diatreme's Northern Silica Project, the JORC Code shows that only Measured, Indicated and Inferred Mineral Resources are reported. This implies a lower level of geological knowledge and confidence. Further, this classification does not consider any Modifying factors, which are used in the considerations for converting Mineral Resources to Ore Reserves including economic factors. Therefore, we lack confidence that the production target statements mentioned in the Scoping Study hold reasonable grounds for us to rely upon in accordance to ASIC guidelines (RG170). As such, Advisory Partner discounted statements regarding

the production target and only used the EV/Resource method to value the shares of Diatreme.

8.5 CFSM Sublease

A lease signed by Mitsubishi's Cape Flattery Silica Mines (Sublessee) with Far North Queensland Ports Corporation Limited (Sublessor) on 02 January 2018, highlights the Sublessee's rights for potential Prospective Users. As Diatreme requires access to this existing infrastructure, the company will be required to enter an agreement with Mitsubishi as either a Full or Part Facility User. As such, the following conditions may need to be met for DRX to use the port facility according to the Lease Document.

Table 46: Key Conditions outlined in the Sublease Agreement

Reference	Description
A.1.7.3	An obligation on the part of the Facility user to concede priority rights for use of the Facility to the Sublessee.
A.1.7.4	An obligation on the part of a Part Facility User to make good any damage caused to the Facility through its operations or actions of its workers
A.1.7.5	An obligation for Part Facility User to indemnify and release the Sublessor and Sublessee from liability and all claims any way connected with its use of the Facility as a Part Facility User
A.1.7.6	An obligation for Part Facility User to take out and maintain a policy of public liability insurance
B.3	As a Full Facility User, the Sublessee must be informed of the nature, extent and period of operations of the Prospective User. Along with this, the Prospective User must negotiate with the impact on Sublessee's business operations on the Land, the Reserve Throughput Capacity and anything that may be relevant as a result of the Prospective User's use of the facility
B.4	The rights of the Part Facility User under the licence will be subject to the Sublessee's rights of priority in the Essential User Terms referred to in A.1.7.3. This agreement will permit the Part Facility User to have access to and from Sublessor's Property via roads, pathways and other areas.
B.7	Sublessee will consent to a Prospective user who intends to be a Part Facility User to make use of the Sublessor's Property unless the Sublessee considers that the probable consequence would be to materially prejudice, disrupt or interfere with the use that the Sublessee makes of the Facility or the business it conducts from the Land, or the Sublessee will be prohibited from achieving its Reserve Throughput Capacity.
C.10.4	If the Sublessor decided to extend the wharf, a third party making use of the Extended Area may be a Part Facility User or a Full Facility User

Source: AP Analysis

According to Diatreme's Initial Advice Statement (IAS) as highlighted in Cowie Environmental Services report and taken from the IAS, Diatreme acknowledges that they must gain approval for Mitsubishi's existing marine infrastructure. Extract from the Diatreme NSP IAS states the following:

"Within the Port of Cape Flattery, Diatreme will require access to a barge ramp to support initial construction as well as relevant maritime infrastructure for export of the silica product via an Ocean Going Vessel. At present, the following options (in order of preference) are being considered by Diatreme for maritime infrastructure to support the NSP:

- 1. Use of an existing barge ramp operated by Cape Flattery Silica Mine (CFSM) in port limits and the use of the existing Port of Cape Flattery wharf (and conveyor structure) which is owned by the far North Queensland Ports Corporation (trading as Ports North) but operated by CFSM as the lessee. This option involves no new maritime infrastructure being developed for the NSP, although some minor modification*

to existing structures may be required. This option is subject to a suitable commercial and operational agreement being reached with CFSM and Ports North

2. *Construction of a new rock barge facility within the limits of the port to support initial construction and then use of the same structure for transshipment of silica product to a moored ocean-going vessel (OGV). The mooring arrangement for the OGV could either be at the existing berth of the Port of Cape Flattery Wharf (if there is capacity and the activity is permitted by the Port and CFSM) or else the construction of mooring dolphins seaward of the existing wharf.*
3. *Construction of a new barge facility as per option 2 and constructing a permanent extension to the existing wharf (e.g. via lengthening and/or widening of the wharf structure). This option allows for NSP operations to occur completely in parallel with existing CFSM operations.*

There are ongoing commercial discussions between the Far North Queensland Ports Corporation Limited ('Ports North'), Diatreme and CFSM regarding the ability to share existing infrastructure. A 'part user' agreement is being developed that facilitates access to the Ports North land and to the Cape Flattery wharf for investigations to support the EIS. Pending these discussions and further investigations, a final maritime infrastructure option will be selected. However, this is anticipated to take several months and therefore all three maritime infrastructure options (outlined above) will be subject to environmental assessment as part of the EIS process."

If this "part user" agreement is not struck, or any other required agreements with CFSM are not made, Diatreme will be required to reassess their approach for NSP's marine infrastructure which leads to further unknown approval constraints.

The NSP Scoping Study further indicates that Diatreme has intentions to have a production capacity of 3Mtpa initially, then expanding to 5 Mtpa after two years of operations. This combined with Mitsubishi's current production rate, exceeds the current export limit for the facility under the existing Environmental Authority.

8.6 Enterprise value to resource tonne (EV/Resource) Method

As Diatreme has two major resources it explores, the total resources need to be considered. Therefore, different sets of comparable companies were identified. To identify possible comparators, the following screening criteria was used on Capital IQ:

- Industry Classification In Diversified Metals and Mining;
- Business Description includes "Heavy Metals" or "Silica"; and
- Company Type in Public Company.

This screening criteria allowed the search for any Silica Sand or Heavy Metal mining exploration companies which were publicly traded on the ASX. From the list, certain criteria were used to further filter the screen and return the most comparable companies that are applicable for the valuation of Diatreme. These criteria are summarised in the Table below, where green indicates the company meets the criteria, while red indicates that it does not.

Table 47: Silica Sand Comparable Companies

Silica Sand Screen	Silica Sand	EV > \$15M	Silica as Major Resource	Market Cap > \$20M
Allup Silica Limited				
Australian Silica Quartz Group				
Carbine Resources Limited				
Industrial Minerals Ltd				
Metallica Minerals Limited				
VRX Silica Limited				

Source: Capital IQ and AP Analysis

Table 48: Heavy Metals Comparable Companies

Heavy Metals Screen	Heavy Minerals	EV < \$100M	Zircon as majority Grade	Market Cap < \$130M
Astron Corporation Limited				
Astute Metals NL				
Base Resources Limited				
Heavy Minerals Limited				
Iluka Resources Limited				
Sheffield Resources Limited				

Source: Capital IQ and AP Analysis

From these tables, companies that met at least three (3) of the criteria were chosen as an appropriate comparable for Diatreme. The tables below outline the EV/Resource multiples for the chosen companies.

Table 49: Silica Sand Comparable Companies Summary

Company Name	Development Stage	Market Cap (AU\$M)	EV (AU\$M)	Total JORC Resource Silica (Mt)	Implied EV/Resource
Metallica Minerals Limited	Feasibility Study	26.90	22.40	49.50	0.45x
Industrial Minerals Ltd	Exploration	16.50	15.40	12.40	1.24x
VRX Silica Limited	Feasibility Study	58.34	57.20	1,380.50	0.04x
Min		16.50	15.40	12.40	0.04x
Average		33.91	31.67	480.80	0.58x
Median		26.90	22.40	49.50	0.45x
Max		58.34	57.20	1,380.50	1.24x

Source: Capital IQ and AP Analysis

Table 50: Heavy Minerals Mine Comparable Companies Summary

Company Name	Development Stage	Market Cap (AU\$M)	EV (AU\$M)	Total JORC Resource HM (Mt)	Implied EV/Resource
Astute Metals NL	Scoping Studies	11.91	9.90	127.00	0.08x
Base Resources Limited	Mining	163.74	21.7	57.82	0.38x
Heavy Minerals Limited	Scoping Studies	4.44	4.10	166.00	0.02x
Min		4.44	4.10	57.82	0.02x
Average		60.03	11.90	116.94	0.16x
Median		11.91	9.90	127.00	0.08x
Max		163.74	21.70	166.00	0.38x

Source: Capital IQ

The following observations were made with respect to the comparable companies:

- **Metallica Minerals Limited** is an exploration company, predominantly in Silica sand with their flagship project in the Cape Flattery Region.
- **Industrial Minerals Ltd** is a mineral exploration company with headquarters in Perth, with a portfolio of exploration projects in Western Australia, focused on Silica Sands.

- **VRX Silica Ltd** is the most advanced pure-play silica sand company that is listed on the ASX and is has most projects located in Western Australia.
- **Astute Metals NL** is a diversified exploration company with operations in the US, Western Australia Northern Territory, with their focus on the exploration of Heavy Mineral Sands.
- **Base Resources Limited** produces and sells heavy mineral sands in Africa, with a focus on Rutile, Ilmenite and Zircon. The company is dual listed on the ASX and UK's AIM.
- **Heavy Minerals Limited** is an Australian based Industrial minerals company, with projects in Western Australia.

Although these companies vary in their operations to Diatreme, the analysis provides an indicative range of EV/Resources that may be relevant for the purposes of valuing Diatreme. To derive an appropriate multiple, a weighting for each company must be determined. For the Silica Sand screen, all three companies satisfied the criteria, and thus, an equal weighting was given for all three companies. For the Heavy Minerals screening, a different weighting process was required. We ascribed 40% to companies which fulfilled every criterion and deducted 10% weighting for each characteristic missed. The following table highlights our analysis.

Table 51: Multiples Summary

Analysis	EV/Silica Resource	EV/HM Resource
Minimum	0.04x	0.01x
Median	0.45x	0.02x
Average	0.58x	0.04x
Weighted Average	0.58x	0.05x
Maximum	1.24x	0.10x
Skew	0.89	1.68

Source: AP Analysis

To determine the skew, we used the formula below, which highlights the symmetry of a data set:

$$\frac{n}{(n-1)(n-2)} \sum \left(\frac{x_i - \bar{x}}{s} \right)^3$$

Through comparing the comparable list of companies to DRX's business operations, we have determined an appropriate weighting. As a result, we have determined the weighted average multiple and used this as the high end of our range. Furthermore, we have assessed the skew and statistical outliers within the comparable companies and as a such, determined that the median multiple to be used for the low valuation of our range.

As DRX's projects include Silica and Heavy Minerals, the two projects will be valued through a Sum of Parts once an Enterprise Value has been determined for each project. For Diatreme's Northern Silica Project, the appropriate EV/Silica Resource Multiple is determined to be in the range of 0.45x to 0.58x Silica Resource. Similarly, for Diatreme's Cyclone Project, we have determined the appropriate multiple to be in the range of 0.02x to 0.05x HM Resource.

8.7 Clermont Copper Gold Project

Diatreme holding 49% of the Clermont Copper Gold Project with Metallica Minerals holds 51%. The project does not have any JORC resources or reserves. We were able to identify a comparable transaction which was the sale of the Nullagine Gold Project in December 2023 to Calidus Resources Limited. The project was sold for \$250,000 plus a further payment of \$5,000,000 based on reaching certain production targets. The tenement area is 533 square kilometers.

The Clermont project is 252.36 square kilometers in the same region. Metallica has paid \$1,000,000 for its 51% of the project as part of its farm in arrangement with Diatreme. On a per square kilometer basis when

comparing with the Nullagine Project it represents a comparable value for 100-% of the Clermont project of \$2.48M. We have valued the 49% of Clermont project at \$960,784, based on the valuation Metallica paid for the farm-in.

8.8 Surplus Assets

Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company. These are assets which, if sold, would not impact on the revenue or profit generating capacity of the entity. From the analysis of Diatreme's financial statements, cash was concluded to be a surplus asset.

8.9 Valuation conclusion

Advisory Partner's value of Diatreme is derived from the EV/Resources multiple and is summarised as follows:

As Diatreme has excess cash, this was included in the Enterprise Value below. We have used the figures from the latest Annual Report on 31 December 2023 as the most current information on the cash and debt position.

Table 52: Diatreme Net Cash Calculation

Diatreme (Net Debt) / Net Cash	Amount
Cash	30,272
(-) Current Portion of Debt	(1,525)
(-) Long Term Portion of Debt	-
Net Cash	28,747

Source: AP Analysis

Our valuation of Diatreme derived from the EV/Resources is summarised as follows. We have used an Resources multiple range of 0.45x to 0.58x for Silica and 0.02x to 0.05x for HM based on the comparable companies listed in section 7.1.

Table 53: Diatreme Valuation Summary

Diatreme Valuation	Low	High
Silica Projects		
NSP Silica Resources (tonnes)	235	235
WRA Silica Resources (tonnes)	91.7	91.7
Galalar Silica Resources (tonnes)	75.46	75.46
Total Diatreme Silica Resources (tonnes)	402.16	402.16
Comparable EV/Silica Resource Multiple	0.45x	0.58x
Implied Enterprise Value	181.99	232.70
Silica Project Joint-Venture ownership	73.20%	73.20%
Implied Enterprise Value attributable to DRX	133.21	170.34
Cyclone Project Heavy Minerals Resources (tonnes)	203	203
Comparable EV/Resource Multiple	0.02x	0.05x
Implied Enterprise Value of Cyclone Project	4.06	10.15
Enterprise Value of Clermont Project Attributable to DRX (49%)	0.96	0.96
Sum of Parts (AU\$M)	138.24	181.45
Add/(Less):		
Net Cash	29	29
Equity Value	166.98	210.20

Source: AP Analysis

This represents a per share value below:

Table 54: Diatreme Valuation Per Share

Diatreme Valuation per Share	Low	High
Fair Value of Equity	166.98	210.20
Fully paid ordinary shares outstanding	3,730	3,730
Outstanding Options & Performance Rights	67	67
Equity Value Per Share	0.044	0.055

We have assessed the value of Diatreme based on the EV/Resources method to be in the range of **\$0.044** to **\$0.055** per share.

8.10 Share Valuation Cross Check

To perform a share valuation cross check, Advisory Partner examined previous capital raises that Diatreme has performed. The five most recent are detailed below:

Table 55: Diatreme's Recent Capital Raisings

Announce Date	Offering Type	Transaction Status	Offering Price	Total Shares Offered	Offering Size (000)
27/06/2022	Common Stock	Priced 27/06/2022	0.03	559,465,000	13,987
27/06/2022	Common Stock	Priced 29/08/2022	0.03	132,111,500	3,303
6/09/2021	Common Stock	Priced 6/09/2021	0.02	438,260,914	10,080
9/10/2020	Share Purchase Plan	Priced 15/10/2020	0.01	253,642,500	2,536
9/10/2020	Common Stock	Priced 9/10/2020	0.01	463,862,800	4,639
6/11/2019	Common Stock	Priced 21/11/2019	0.01	363,428,729	3,634

Source: Capital IQ

From the most recent capital raise of \$0.025 per share, it supports Advisory Partner's valuation of Diatreme's shares to be in the range of **\$0.025** to **\$0.033**.

9.0 Fair Value of Entity Post-Transaction

9.1 Share Valuation Cross Check

The total value of Diatreme post-transaction on a minority basis is outlined below.

Table 56: Post Transaction Fair Value Summary

Value of entity post-transaction	Low	High
Equity Value of MLM	70.01	75.06
Equity Value of DRX	166.98	210.20
Total value of combined entity	236.99	285.26
DRX Shares Outstanding	3,729.76	3,729.76
New Shares Issued (1.3319 * MLM Shares)	1,321.14	1,321.14
Total Shares post-transaction	5,050.90	5,050.90
Fair Value of entity post-transaction (minority basis)	0.047	0.056

10.0 Assessment of Fairness

In forming our opinion in relation to the fairness of the Offer, we have valued each component of the proposal being the fair market value of a Metallica share and the fair market value of the consideration.

Table 57: Fair Value

Fair Value	Low Value	High Value
Fair Value of Metallica share on a controlling basis	0.071	0.076
Fair Value of combined entity post-transaction (minority basis)	0.047	0.056
Premium / (Discount)	-34%	-25%

Advisory Partner assessed the fair market value of Metallica shares, on a control basis, is between \$0.071 and \$0.076 per share. By comparison, the assessed value of the shares post-transaction is between \$0.047 and \$0.056. As demonstrated above, the value of the combined entity per share is lower than the value of a Metallica share and as a result, the Offer is considered not fair and not reasonable for shareholders of Metallica.

11.0 Reasonableness

Reasonableness

We deem the offer to be not reasonable to shareholders of Metallica as we consider the disadvantages to outweigh the advantages of the offer. To assist the Shareholders in their decision-making process we have summarized the following:

- The likely advantages and disadvantages associated with the Offer; and
- Alternatives, including the position of Shareholders if the Offer does not proceed.

Shareholders of Metallica should read the full Report, where matters relevant to shareholders are explained in more detail.

Advantages of Approving the Offer

Set out below is a summary of the key advantages to the Shareholders of accepting the Offer.

- **Liquidity of shares**
Metallica shareholders currently face illiquidity in the trading of their shares. On a typical trading day, Metallica shares are thinly traded and have a wide bid-ask spread. As a result, it is difficult to sell shares in Metallica. The transaction may improve liquidity in the shares of the combined entity by increasing the market capitalisation and outstanding share count.
- **Economies of Scale**
The combined entity may provide operational improvements for the mines as both companies hold an interest in mines within the same vicinity.

Disadvantages

- **Dilution of Shares**
As both companies have projects which are pre-development, shareholders are at risk of future capital raisings which may dilute minority shareholders. The non-associated shareholders (excludes common shareholders) of Metallica Minerals and Diatrema Resources account for 49.87% of total shares in Metallica Minerals. This takeover offer sees that decrease to 12.73% of total shares in Diatrema. Diatrema's projects hold 513 Mt of resources, while Metallica holds 47 Mt of reserves at their CFS project according to the feasibility study. As such, Diatrema will require substantial efforts to acquire funding for the projects relative to Metallica, which are likely to be through the issuance of new ordinary shares.
- **Diatrema Funding Risk and Dilution**
If Diatrema successfully acquires Metallica Minerals, the company will be required to raise capital to fund the CFSS Project. This will further dilute the non-common Metallica shareholders who will already represent a minority interest in Diatrema (as stated in the above dot point). Our valuation of Metallica accounts for the dilution discount applied to the CFSS Project as outlined in Section 6.5 and Appendix G. The post-transaction valuation accounts for the dilutive discount of CFSS and the dilutive impact of the consideration. As set out in the post-transaction valuation, the value of the entity, including Diatrema, does not outweigh the value of Metallica.
- **Voting Power**
Diatrema has 3.7bn shares outstanding pre-transaction and will issue 1.278bn shares to Metallica shareholders for the transaction. As such, non-associated Metallica shareholders will represent 25.6% of total shares post-transaction which is a minor representation in voting power relative to their prior 100% voting power in Metallica Minerals Limited.
- **Project Risk**
Diatrema's Northern Silica projects are at scoping study stage. This early stage of development has not been proven to be economically viable by an independent technical expert and may face unforeseeable factors in order to develop the project in terms of operational costs, environmental

requirements, capital expenditures, and other variables which may impact the value of the mine. By accepting the offer, Metallica shareholders will be exposed to these risks which may determine whether or not these mines are viable and whether they can be funded.

Other Considerations

- **Common Shareholders**

Metallica and Diatreme have common shareholders. Ilwella Pty. Ltd (“Ilwella”) and SCR-Sibelco N.V. (N.V.) are the top two shareholders of both Diatreme and Metallica Minerals. Sibelco publicly backed the takeover offer from Diatreme. Furthermore, Delphi Unternehmensberatung AG (Delphi AG) controls Sparta AG. In particular, Delphi AG owns 100% of VVBeteiligungen AG, a majority shareholder of Deutsche Balaton AG which has a majority ownership of Sparta AG. With Metallica’s top three shareholders being Ilwella, Sibelco and Sparta AG this takeover suggests limited dilution for major shareholders who continue to retain a significant ownership of Diatreme post-takeover of Metallica.

- **Mitsubishi (CFSM) Sublease**

Diatreme is required to build significant port infrastructure near CFSM’s operations and wishes to utilise the existing wharf. The Sublease between Far North Queensland Ports Corporation Ltd and Cape Flattery Silica Mines Pty Ltd (CFSM) gives CFSM certain rights that may make this difficult both during operations and construction. However, PAEMAC’s report states that the construction of Diatreme’s port infrastructure will cause unavoidable disturbances to Mitsubishi’s operations. As such, it gives CFSM reasons to not allow Diatreme to access the existing infrastructure or proceed with the planned construction activities. This would impact Diatreme’s ability to export.

Shareholder circumstances

Advisory Partner has not considered the effect of the Offer on the particular circumstances of individual Shareholders. Some individual Shareholders may place a different emphasis on various aspects of Proposed Transaction from that adopted in this Report. Accordingly, individuals may reach different conclusions as to whether or not the Offer is in their individual best interests. The decision of an individual Shareholder in relation to the Offer may be influenced by their particular circumstances (including their taxation position) and accordingly, Shareholders are advised to seek their own independent advice.

Other matters

This Report has been requested by the Metallica Directors to assist the Shareholders in their decision to accept or reject the Proposed Transaction.

This Report should not be used for any other purpose and Advisory Partner does not accept any responsibility for its use outside this purpose. Except in accordance with the stated purpose, no extract, quote or copy of our Report, in whole or in part, should be reproduced without our written consent, as to the form and context in which it may appear.

Advisory Partner acknowledges that this Report may be lodged by the Directors with the ASX.

12.0 Qualifications, Declarations, and Consents

12.1 Qualifications

Advisory Partner provides corporate advisory services in relation to mergers and acquisitions, capital raisings, corporate restructuring and financial matters generally. One of its activities is the preparation of company and business valuations and the provision of independent advice and expert's reports in connection with mergers and acquisitions, takeovers and schemes of arrangements. Advisory Partner's Director has prepared a number of public expert's reports.

The principal person responsible for preparing this Report on behalf of Advisory Partner is Brett Plant, BBus, MCom, FCA, he is a Director of Advisory Partner. Mr Plant has been actively involved in the preparation of this report. Mr Plant has in excess of 20 years experience in the commerce and the accountancy profession and has been involved in specialist corporate advisory services including company valuations, business sales, due diligence investigations, independent experts' reports as well as other corporate investigations for more than 10 years. Mr Plant has the appropriate experience and professional qualifications to provide the advice offered.

12.2 Declarations

It is not intended that this Report should be used or relied upon for any purpose other than as an expression of Advisory Partner's opinion as to whether the Offer is fair and reasonable and for Shareholders of Metallica as a whole. Advisory Partner expressly denies any liability to any Shareholder who relies or purports to rely on this Report for any other purpose and to any other party who relies or purports to rely on this Report for any purpose.

This Report has been prepared by Advisory Partner with care and diligence and the statements and opinions given by Advisory Partner in this Report are given in good faith and in the belief on reasonable grounds that such statements and opinions are correct and not misleading. However, no responsibility is accepted by Advisory Partner or any of its directors, officers or employees for errors or omissions however arising in the preparation of this Report, provided that this shall not absolve Advisory Partner from liability arising from an opinion expressed recklessly or in bad faith (unless the law otherwise requires).

12.3 Independence

Advisory Partner is entitled to receive a fee of \$55,000 to \$65,000 (exclusive of GST) for the preparation of this Report. Advisory Partner is also entitled to be reimbursed for any out-of-pocket expenses incurred in the preparation of this Report. Except for this fee and the reimbursement of these expenses, Advisory Partner has not received and will not receive any pecuniary or other benefit, whether direct or indirect, in connection with the preparation of this Report.

Neither the signatory to this Report nor the Advisory Partner holds securities in Metallica Minerals. No such securities have been held at any time over the last two years.

Neither the signatories to this Report nor Advisory Partner have had within the past two years any business relationship material to an assessment of Advisory Partner's impartiality with in Metallica Minerals or its associates.

Prior to accepting this engagement, Advisory Partner considered its independence with respect to Metallica Minerals and any of its respective associates with reference to ASIC Regulatory Guide 112 entitled "Independence of Experts". In Advisory Partner's opinion, it is independent of in Metallica Minerals and its associates.

A draft of this Report was provided to Metallica and its advisors for confirmation of the factual accuracy of its contents. No significant changes were made to this Report as a result of this review and there was no alteration to the methodology, evaluation or opinions set out in this Report as a result of issuing the draft.

12.4 Indemnity

Under the terms of our engagement, Metallica has agreed that no claim shall be made by Metallica or any of its subsidiaries against Advisory Partner, any of their directors, officers, partners, employees or agents (Indemnified Persons) to recover any loss or damage which Metallica or any of its subsidiaries may suffer by reason of or arising out of anything done or omitted in relation to the provision of the services by Advisory Partner, provided that such loss or damage does not arise from the negligence or willful default of any of the Indemnified Persons. Metallica has unconditionally indemnified Advisory Partner and their respective officers, employees and agents against any losses, claims, damages, liabilities, costs, expenses and outgoings whatsoever (Losses) which they may suffer or incur directly or indirectly arising out of:

- Advisory Partner relying on information provided by Metallica or any of its employees, agents or advisers; or
- Metallica failing to provide Advisory Partner with material information in relation to the Proposed Transaction.

Further, Metallica must pay and must indemnify Advisory Partner against any Losses in relation to any investigations, enquiries or legal proceedings by ASIC or any other competent regulatory body arising out of, or in connection with, the Proposed Transaction, including reasonable legal expenses and disbursements incurred by Advisory Partner and fees payable to Advisory Partner attributable to time reasonably spent by its staff assessed at its hourly rates to the extent that investigation, enquiry or legal proceeding is not caused by an act or omission of the Indemnified Persons.

12.5 Consents

Advisory Partner consents to the issuing of this Report in the form and context in which it is to be included in the Target Statement to be sent to the Shareholders. Neither the whole nor any part of this Report nor any reference thereto may be included in, or attached to, any other document without the prior written consent of Advisory Partner as to the form and context in which it appears.

Advisory Partner takes no responsibility for the content of the Target Statement or any other documents provided to the Shareholders, other than this Report.

12.6 Other

The opinion of Advisory Partner is made at the date of this Report and reflects circumstances and conditions as at that date. In particular, Advisory Partner provides no representations or warranties in relation to the future value of shares of Metallica.

Shareholders who are in any doubt as to the action they should take should consult their own independent professional advisers.

Advisory Partner has prepared a Financial Services Guide as required by the Act. The Financial Services Guide is set out at the beginning of this Report.

Appendix A: Sources of Information

In preparing this report we have had access to and relied upon the following principal sources of information:

- In preparing this report, Advisory Partner identified certain matters that required specialist expertise. In particular, given the importance of Metallica's definitive feasibility study (DFS) in our assessment of value, we considered it appropriate to seek a specialist expert assessment of the reasonableness of the assumptions underlying the DFS, the conclusions in the DFS and whether any critical risks have been omitted from the DFS. We also sought some general observations from SRK on the mining and geological information available in Diatreme's scoping study. SRK was engaged by us and provided that feedback and any additional commentary on areas we considered appropriate to confirm. Relevantly, SRK was not engaged to value the Mineral Resources or mining tenements of Metallica, nor provide a report in accordance with the VALMIN Code on any matter nor to review and comment on a final draft of this report. Accordingly, we are comfortable, based on the work that SRK has undertaken under our engagement with them, that our valuation of the Cape Flattery Project, which we have undertaken on a discounted cash flow basis (DCF), is appropriate, is based on reasonable assumptions and is not subject to any critical flaws. In seeking this specialist input from SRK, we are satisfied that SRK is independent of Metallica;
- audited annual reports of Metallica for the years ended 30 June 2021 to 30 June 2023;
- audited accounts for half-year ended 31 December 2023;
- details of Metallica's shareholders and share register as at 30 June 2023;
- historical trading volumes and prices of Metallica's ordinary shares traded on the Australian Stock Exchange ("ASX");
- various ASX announcements;
- meeting with management and management working papers in relation to the transaction;
- Statement on Monetary Policy, Reserve Bank of Australia, February 2023;
- Prime Gain Limited Market Report;
- PAEMAC Report;
- Cowie Environmental Services Report;
- S&P Capital IQ;
- Definitive Feasibility Study July 2023 and Updated November 2023;
- Diatreme NSP Scoping Study June 2023;
- other publicly available information on Metallica and Diatreme.

In addition to the above, Advisory Partner has had various discussions with the management, officers and advisers of Metallica regarding the nature of Metallica's businesses, their operations, financial position and prospects.

Appendix B: Valuation Methods

In conducting our assessment of the fair market value of the Company, the following commonly used business valuation methods have been considered:

Discounted Cash Flow Method

The discounted cash flow (“DCF”) method is based on the premise that the value of a business or any asset is represented by the present value of its future cash flows. It requires two essential elements:

- the forecast of future cash flows of the business asset for a number of years (usually five to 10 years); and
- the discount rate that reflects the riskiness of those cash flows used to discount the forecast cash flows back to net present value (“NPV”).

DCF is appropriate where:

- the businesses’ earnings are capable of being forecast for a reasonable period (preferably five to 10 years) with reasonable accuracy;
- earnings or cash flows are expected to fluctuate significantly from year to year;
- the business or asset has a finite life;
- the business is in a 'start up' or in early stages of development;
- the business has irregular capital expenditure requirements;
- the business involves infrastructure projects with major capital expenditure requirements; or
- the business is currently making losses but is expected to recover.

Capitalisation of Future Maintainable Earnings Method

This method involves the capitalisation of estimated future maintainable earnings by an appropriate multiple. Maintainable earnings are the assessed sustainable profits that can be derived by the vendor’s business and excludes any one off profits or losses. An appropriate earnings multiple is assessed by reference to market evidence as to the earnings multiples of comparable companies.

This method is suitable for the valuation of businesses with indefinite trading lives and where earnings are relatively stable or a reliable trend in earnings is evident.

Net Realisable Value of Assets

Asset based valuations involve the determination of the fair market value of a business based on the net realisable value of the assets used in the business.

Valuation of net realisable assets involves:

- separating the business or entity into components which can be readily sold, such as individual business units or collection of individual items of plant and equipment and other net assets; and
- ascribing a value to each based on the net amount that could be obtained for this asset if sold.

The net realisable value of the assets can be determined on the basis of:

- *orderly realisation*: this method estimates fair market value by determining the net assets of the underlying business including an allowance for the reasonable costs of carrying out the sale of assets, taxation charges and the time value of money assuming the business is wound up in an orderly manner. This is not a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value;

- *liquidation*: this is a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value; or
- *going concern*: the net assets on a going concern basis estimates the market value of the net assets but does not take into account any realisation costs. This method is often considered appropriate for the valuation of an investment or property holding company. Adjustments may need to be made to the book value of assets and liabilities to reflect their going concern value.

The net realisable value of a trading company's assets will generally provide the lowest possible value for the business. The difference between the value of the company's identifiable net assets (including identifiable intangibles) and the value obtained by capitalising earnings is attributable to goodwill.

The net realisable value of assets is relevant where a company is making sustained losses or profits but at a level less than the required rate of return, where it is close to liquidation, where it is a holding company, or where all its assets are liquid. It is also relevant to businesses which are being segmented and divested and to value assets that are surplus to the core operating business. The net realisable assets methodology is also used as a check for the value derived using other methods.

These approaches ignore the possibility that the company's value could exceed the realisable value of its assets.

Share Market Trading History

The application of the price that a company's shares trade on the ASX is an appropriate basis for valuation where:

- the shares trade in an efficient market place where 'willing' buyers and sellers readily trade the company's shares; and
- the market for the company's shares is active and liquid.

Constant Growth Dividend Discount Model

The dividend discount model works best for:

- firms with stable growth rates;
- firms which pay out dividends that are high and approximate free cash flow to equity;
- firms with stable leverage; and
- firms where there are significant or unusual limitations to the rights of shareholders.

Special Value

Special value is the amount which a potential acquirer may be prepared to pay for a business in excess of the fair market value. This premium represents the value to the potential acquirer of potential economies of scale, reduction in competition or other synergies arising from the acquisition of the asset not available to likely purchasers generally. Special value is not normally considered in the assessment of fair market value as it relates to the individual circumstances of special purchases.

Appendix C: Discount Rate

Overview

When applying the discounted cash flow method, the cash flows expected to be generated by an asset are discounted to their present value by using a discount rate that reflects the relative risk of the investment, as well as the time value of money.

Selection of an appropriate discount rate to apply to the forecast cash flows of a company fundamentally is a matter of judgment. There is a formulaic approach that can and is derived by theory; however, a mechanistic application of financial theory can result in a discount rate that is not applicable in reality. Hence, it should be stressed that there is no "correct" discount rate. Despite the growing acceptance and application of various theoretical models, many company may rely on less sophisticated approaches and use relatively arbitrary "hurdle rates" which do not vary significantly over time despite interest rate movements.

There are three main considerations to the determination of an appropriate WACC, namely cost of equity, cost of debt and debt/equity mix.

The cost of equity was derived from the Capital Asset Pricing Model ("CAPM") methodology. The CAPM is probably the most widely accepted and used methodology for determining the cost of equity capital. However, while the theory underlying the CAPM is rigorous, the practical application is subject to shortcomings and limitations and the results of applying the CAPM model should only be regarded as providing a general guide.

Weighted Average Cost of Capital (WACC)

To ensure consistency with the cash flow projections of Metallica, the WACC should be on a nominal post tax basis. The standard formula used to calculate a nominal post tax WACC under a dividend imputation system is given by:

$$WACC = r_e \frac{E}{V} + r_d \frac{D}{V} (1 - t_c(1 - \gamma))$$

Where:

V	sum of debt and equity values;
E	value of equity;
D	value of debt;
Re	cost of equity;
Rd	cost of debt;
t_c	the corporate tax rate; and
γ	the value of imputation tax credits (gamma)

This is an after-tax discount rate to be applied to nominal ungeared after-tax cash flows.

Overview of the CAPM Framework

The CAPM provides a theoretical basis for determining a discount rate that reflects the returns required by diversified investors in equities. CAPM is based on the assumption that investors require a premium for investing in equities above risk free investments (such as Australian government bonds). The premium is commonly known as the market risk premium and notionally represents the premium required to compensate for investment in the equity market in general.

The risks associated with an investment in a company can be classed as either specific risks or systematic risks. Specific risks are risks that are specific to a particular company or business and are unrelated to movements in equity markets. Systematic risk is the risk that returns from an investment or business will vary with market returns in general. If returns on an investment are expected to be perfectly correlated with

returns on the market, then the return required on the investment would be equal to the return required from the market (ie. the risk-free rate plus the market risk premium).

CAPM postulates that the return required on investment or assets can be estimated by applying to the market risk premium a measure of systematic risk described as the equity beta factor. The equity beta for an investment reflects the covariance of the return from that investment with the return from the market as a whole. Covariance is a measure of relative volatility and correlation. The equity beta of an investment represents its systematic risk only. It is not a measure of the total risk of a particular investment. In general, an investment with an equity beta greater than 1 is riskier than the market and an investment with a beta of less than 1 is less risky.

The formula for deriving the cost of equity using CAPM is as follows:

$$R_e = R_f + \beta(R_m - R_f)$$

Where:

R_e	is the expected return on equity;
R_f	is the risk free rate;
β	is the equity beta factor;
R_m	is the expected market return; and
$R_m - R_f$	is the market risk premium.

The equity beta for a company is normally estimated by observing the historical relationship between returns from the company or comparable company and returns from the market in general. In our analysis, we have chosen to observe the historical 3-year relationship between returns from comparable companies to Metallica.

Risk free rate

The risk-free rate compensates the investor for the time value of money including the expected inflation rate over the investment period. In practice, for going concern Australian companies, the ten-year Commonwealth Government Bond rate is a widely used and accepted proxy for the risk-free rate. This rate is a nominal rate and therefore includes inflation.

For the purpose of this report, Advisory Partner has adopted the ten-year Australian Government Bond rate as at 1st of March 2024 at 4.12% as a proxy for the risk-free rate in determining the cost of equity for Metallica.

Equity market risk premium

The market risk premium ($R_m - R_f$) represents the additional return that investors require to invest in equity securities as a whole over a risk-free investment which is not observable and therefore a historical premium is used as a proxy. Australian studies¹ have been limited but indicate that the long run average premium has been in the order of 6.0-6.5% measured over more than 100 years of data.

The market risk premium is not constant and may change over time as investors perceive that equities are more risky than at other times and will increase or decrease their expected premium.

A market risk premium of 6.0-6.5% has been assumed which Advisory Partner believes is within the range of generally accepted figures of long-term market risk premiums in the Australian capital market.

Beta

The beta coefficient is a measure of the expected volatility and therefore risk of a company's stock relative to the market portfolio.

The beta of a stock is determined by the characteristics of the firm and is generally based on three factors:

- the nature of revenue and the extent to which it is cyclical;
- operating leverage; and
- financial leverage.

The expected beta cannot be observed; therefore, the historical beta is usually used as a proxy for the expected beta. A beta can be estimated by regressing the excess returns of the stock or comparable against the excess returns of the index representing the market portfolio.

Equity Beta estimate

To obtain an equity beta, Advisory Partner has considered the betas of Silica Sand and Heavy Metal explorers and producers listed on the ASX. We've assessed the comparable business operations between Metallica and the following companies in Appendix E. The betas for listed silica sands comparable companies and other mining companies that may be considered comparable to Metallica are listed below.

Ticker	Name	Total Debt	Mkt. Cap.	Debt / Capital	5-Year Beta	Unlevered Beta
ASX:DRX	Diatreme Resources Limited	1.53	78.30	1.91%	0.67	0.66
ASX:ASQ	Australian Silica Quartz Group	0.00	14.10	0.00%	0.88	0.88
ASX:INF	Infinity Lithium Corporation Limited	0.00	33.80	0.00%	1.36	1.36
ASX:EV1	Evolution Energy Minerals Limited	0.00	25.90	0.00%	0.73	0.73
ASX:ZNC	Zenith Minerals Limited	0.00	30.00	0.00%	1.49	1.49
ASX:GRE	GreenTech Metals Limited	0.00	23.10	0.00%	1.03	1.03
ASX:VRC	Volt Resources Limited	0.00	26.80	0.00%	1.21	1.21
ASX:AZI	Altamin Limited	0.00	21.90	0.00%	1.66	1.66
ASX:MLM	Metallica Minerals Limited	0.40	26.90	1.47%	1.05	1.04
Min		0.00	14.10	0.00%	0.67	0.66
Median		0.00	26.35	0.00%	1.12	1.12
Mean		0.19	31.74	0.24%	1.13	1.13
Max		1.53	78.30	1.91%	1.66	1.66

1. The impact of differing capital structures is removed in the calculation of the unlevered betas (Asset Beta).

There are significant measurement issues with beta, which means that only limited reliance can be placed on such statistics. Even measurement of historical betas is subject to considerable variation. It requires a considerable degree of judgement.

The beta is measured on the cash flows returned to equity holders and is therefore after interest. Accordingly, a firm's beta also reflects its capital structure. Since financial leverage is likely to alter between firms it is generally erroneous to make comparison of betas between firms without regard to each firm's leverage. Accordingly, the Company's target debt and equity mix is relevant.

The betas can all be degeared (or 'delevered') to remove the impact of leverage. The method is set out below:

$$Beta(ungeared) = \frac{Beta(g geared)}{(1 + \frac{D}{E} \times (1 - t))}$$

The ungeared or 'asset' betas can then be analysed to determine an appropriate asset beta for the subject of the valuation, and it can be regared (or 'relevered') to reflect the appropriate capital structure. Rearranging the above equation, we have:

$$Beta(geared) = Beta(ungeared) \times (1 + \frac{D}{E} \times (1 - t))$$

The table on the previous page indicates that the median beta for comparable business is approximately 1.12, and when unlevered is approximately 1.12.

Given the differences between Metallica and the comparable companies, at best we regard the data as relevant and informative but not determinate.

We have adopted the average and median unlevered beta of 1.12 and 1.13 for the low and high our analysis.

Cost of Debt Capital

The rate of return required by providers of debt capital is the rate a prudent debt investor would require on interest bearing debt. This rate should reflect the long-term rate of interest required by a debt provider to a business such as the business subject to valuation.

Metallica does not carry any interest-bearing debt, however, for the purposes of evaluating a discount rate under the WACC/CAPM framework, we've anticipated borrowing costs of the company over the forecast period. The management team of Metallica have provided an unsigned term sheet for a \$100m debt facility at 12% interest rate. We've used this as a proxy to estimate the cost of debt and believe 12% is an appropriate pre-tax cost of debt figure.

In recognition that WACC is applied to ungeared after tax cash flow projections and that interest payments to debt providers creates a tax shield, the resulting adjusted debt rate for inclusion in the WACC calculation is 8.4%.

The rate of tax used for calculating the tax shield adjustment is 30%, representing the corporate rate of tax.

Imputation Credits (Gamma)

The WACC set out above assumes a "classical" tax system. The CAPM model is constructed to derive returns to investors after corporate taxes but before personal taxes. Under the US classical tax system, interest expense is deductible to a company but dividends are not. Investors are also double-taxed on dividends received.

Under Australia's dividend imputation system, domestic equity investors now receive a taxation credit (franking credit) for any tax paid by a company, hence eliminating the double taxation associated with US dividends. There are schools of economic thought that argue that the taxation benefits of dividend imputation should be incorporated into any analysis of value. However, Australian studies of the relative value of dividend imputation are controversial and have produced mixed results.

It is worth noting that franking credits can only be utilised in the hands of domestic Australian investors and to a lesser extent, superannuation funds who are eligible for a refund of unused imputation credits (provided that franking credit trading rules are met). Foreign investors are unable to access attached franking credits and hence attribute no additional value to franking credits.

While a number of studies point towards the proposition that some value should be attributed to dividend

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imputation, Advisory Partner considers that the evidence provided by the different schools of thought as to the value that investors attributes to dividend imputation is unclear and as a result we have attributed no value to the Imputation Credits.

Debt and equity mix

According to the principles of modern portfolio finance theory on capital structure an investor, as owner, in a business would seek to utilise an appropriate amount of debt capital in the financial structure of the business on the basis that debt capital is generally cheaper than equity capital and the cost thereof is generally tax deductible. This proposition is balanced, however, with the fact that as the proportion of debt is increased, the financial risk of the business is increased. Accordingly, a target proportion of debt to total capital employed in the business is sought which balances the advantages of this source of funds with the disadvantages attached thereto.

Modern finance theory does not provide a solution to determine the optimum level of gearing in a business, however the use and amount of debt used by participants in the market is observable. Consequently, we have made reference to the debt/capital of comparable companies noted on page 39 in order to benchmark an appropriate level of gearing to assume for the purposes of deriving the WACC applicable to the business of Metallica. We have also had regard to MLM's current gearing level.

In arriving at an appropriate capital structure for Metallica we have had regard to the capital required to fund the initial capex for the project. According to the discounted cash flow analysis, the company requires \$236.7m in initial capital expenditures according to the Update Definitive Feasibility Study. Metallica have engaged Argonaut Capital to assist in raising debt capital for the CFSS Project. The company has had, and continues, to be in discussions with multiple debt providers. Metallica has been in discussions with, and continues to undergo discussions with numerous debt providers for financing options. Additionally, Metallica were offered a term sheet for \$100m in debt at a rate of 12%.

We consider the appropriate capital structure is based upon the capital required to fund the project and have deemed that a 40% debt and 60% equity is a reasonable target capital structure.

Specific Company Risk

A company's cost of equity as derived by the CAPM reflects the level of systematic (or non-diversifiable) risk borne by the company. It does not reflect non-systematic or company specific risks that are inherent in Metallica's operations.

- **Project Risk**
There are general operational risks associated with mining that may cause delays in production or affect expected cashflows from the project. These may include equipment and maintenance, variability in quality of deposits, labour disputes, groundwater issues and other risks which may impact the project value.
- **Environmental Risk**
Mining projects face unique environmental risks which impact production including habitat disruption, water pollution, or air emissions. There are regulatory and legal requirements to fulfill which may take longer than expected, or these requirements may change during the pre-development phase. Metallica had previously faced delays due to the Department of Climate Change, Energy, the Environment, and Water (DCCEEW) decision to require an Environmental Impact Statement (EIS) for the project.
- **Weather Risk**
The feasibility study plans that the mine will be operational 365-days per year and is based on a Time Usage Model (TUM). This has been historically demonstrated by the nearby Mitsubishi mine, however, there is risk of significant weather events as the project operates in tropical northern Queensland and is exposed to cyclone risk.

We consider that calculating a dilution at the current market prices allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.

These company-specific risks in this situation include a number of the legal risks discussed in this report but also include issues associated with the size and lack of liquidity in the stock.

Summary of WACC Parameters

The table below summaries the parameters used and Advisory Partner's determined WACC range.

Weighted Average Cost of Capital	Low	High
Cost of Debt		
Pre-Tax Cost of Debt	12%	12%
Tax Rate	30%	30%
After-Tax Cost of Debt	8.4%	8.4%
Cost of Equity		
Unlevered Equity Beta	1.12	1.13
Relevered Equity Beta	1.64	1.65
Equity Market Risk Premium	6.50%	6.50%
MLM Equity Risk Premium	10.68%	10.75%
Risk Free Rate	4.12%	4.12%
Specific Company Risk	2.00%	3.00%
Cost of Equity	16.80%	17.87%
Proposed Capital Structure		
Debt % Mix	40%	40%
Equity % Mix	60%	60%
Capital	100%	100%
Debt/Equity	0.67	0.67
Weighted Average Cost of Capital (WACC)	13.44%	14.08%

Source: Capital IQ Pro and AP Analysis

Appendix D: Comparator Descriptions

Altamin Limited

Metallica Minerals Limited and Altamin Limited are both Australian-based companies engaged in the mining and development of mineral resources. Each company operates with a strong focus on specific mineral projects and aims to cater to a global customer base. Metallica Minerals and Altamin Limited are actively involved in extracting valuable minerals, emphasizing strategic operations and international market outreach to capitalize on their respective resource-focused business models.

Australian Silica Quartz Group Ltd

Metallica Minerals Limited and Australian Silica Quartz Group Ltd. are similar in that both are Australian-based companies primarily engaged in the extraction and development of silica sand, aiming to serve a global customer base. Each company focuses on the strategic exploration and development of mineral resources specific to their operational interests, with Metallica Minerals targeting high-purity silica sand, while Australian Silica Quartz Group concentrates on both high-grade silica sand and hard rock quartz. Both companies leverage Australia's rich mineral resources to meet the demands of international markets.

Diatreme Resources Limited

Metallica Minerals Limited and Diatreme Resources Limited share common ground as Australian-based companies that focus on the exploration and development of mineral resources. Both companies have a specific interest in silica projects, with Metallica Minerals developing high-purity silica sand and Diatreme Resources focusing on its Northern Silica project in Far North Queensland. Each company aims to harness Australia's mineral resources to address demands in global markets, leveraging their expertise in mineral extraction and development.

Evolution Energy Minerals Limited

Metallica Minerals Limited and Evolution Energy Minerals Limited are both Australian-based companies involved in the exploration and development of mineral resources. Each focuses on specific minerals, with Metallica Minerals dedicated to delivering high-purity silica sand, while Evolution Energy Minerals concentrates on graphite through its Chilalo Graphite project in Tanzania. Both companies use their strategic projects to cater to international markets, capitalizing on Australia's rich mining industry infrastructure and expertise to develop and supply critical minerals.

GreenTech Metals Limited

Metallica Minerals Limited and GreenTech Metals Limited are similar as both are Australian companies engaged in the mineral exploration and development sector. Each company has a strategic focus on specific minerals; Metallica Minerals is focused on high-purity silica sand, whereas GreenTech Metals explores a variety of minerals including nickel, copper, zinc, gold, lithium, and cobalt. Both companies emphasize developing projects that cater to global markets, leveraging Australia's rich geological resources to supply essential minerals for various industrial applications.

Infinity Lithium Corporation Limited

Metallica Minerals Limited and Infinity Lithium Corporation Limited are similar as they are both Australian-based companies engaged in the exploration and development of mineral resources. Each company focuses on different minerals, with Metallica Minerals targeting high-purity silica sand and Infinity Lithium Corporation specializing in lithium, particularly in the production of battery-grade lithium hydroxide. Despite these differences in mineral focus, both companies operate with the common goal of exploring and developing strategic mineral projects, leveraging Australia's rich resources to meet global industrial demands.

Volt Resources Limited

Metallica Minerals Limited and Volt Resources Limited are Australian companies engaged in the development and exploration of mineral resources, though their focuses and geographical areas of operation vary. Both companies are involved in supplying materials crucial to industrial applications, with Metallica Minerals specializing in high-purity silica sand and Volt Resources focusing on graphite production and other critical minerals like lithium-borate, which are essential components in battery technology. Each company utilizes their strategic mineral projects to serve international markets, leveraging Australia's supportive mining infrastructure to expand their global footprint.

Zenith Minerals Limited

Metallica Minerals Limited and Zenith Minerals Limited are both Australian-based companies involved in mineral exploration and development, although they focus on different types of minerals and operate in varying regions. Metallica Minerals primarily focuses on high-purity silica sand, while Zenith Minerals explores a broader range of minerals, including gold, lithium, nickel, and various base and precious metals across Australia, Turkey, and Europe. Both companies are committed to leveraging Australia's rich mineral endowment to develop resources that can meet global demand, each operating with a strategy that emphasizes extensive exploration and project development.

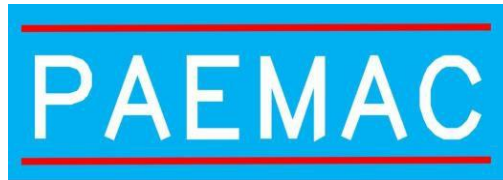
Appendix E: Potential Dilution

We have set out below the potential dilution on our valuation of Metallica Minerals based on the funding required for the CFSS Project.

Notional Capital Raise	\$AUD
Source of Funding:	
Cash Balance	4,821,125
Other Working Capital Balance	(587,378)
\$100m debt funding	100,000,000
Total Funding Available	104,233,747
Funding Commitments:	
Equity funding for CFSS	142,020,000
Total Funding Commitments	236,700,000
Additional Funding Required	132,466,253

Potential Dilution Scenario	Scenario 1	Scenario 2	Scenario 3
No. of Shares	959.92	959.92	959.92
VWAP (2-month)	0.026	0.026	0.026
Funds Required	236.70	236.70	236.70
Equity Raising	132.47	132.47	132.47
Financing Discount/Premium	(25%)	0%	25%
Value Per Share	0.020	0.026	0.033
New Shares Issued	6,680	5,010	4,008
MLM Equity Value (Pre-money)	274.59	274.59	274.59
MLM Equity Value (Post-money)	407.05	407.05	407.05
Value per share before capital raising	0.286	0.286	0.286
Value per share after capital raising	0.053	0.068	0.082
Dilution	-81.37%	-76.16%	-71.35%

We cannot predict the trading price of Metallica Minerals in the future, however, we believe it is reasonable to assume that the 3rd scenario is most appropriate as the trading price is likely to increase as the company reaches milestones developing the CFSS Project. As such, we have applied a 70% dilution discount to the value of CFSS to account for potential future dilutionary effects to fund the project. While the project has reached a Definitive Feasibility Stage there are company specific risks that exist. We consider that calculating a dilution at the current market prices allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.



NORTHERN SILICA SAND PROJECT

ROCK WHARF CONSTRUCTION AND PORT OF CAPE FLATTERY JETTY EXTENSION

BASIS OF ESTIMATE

Document Number

E0533-BOE-001

Approvals

C	3/05/24	PH	DS	DS
B	18/03/24	PH	DS	AS
A	11/03/2024	PH	DS	AS
Rev	Date	Author	Checked by	Approved by

Amendments

Rev	Section	Type of Revision	Date
A	All	Document creation	11/03/2024
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C	limitations	Amendment	3/05/24

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LIMITATIONS:

The opinions, conclusions and recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of this report. Accordingly, PAEMAC cannot accept responsibility or obligation for events or changes to the site occurring after the date that this report was prepared.

Costs for addressing Works have been based on the outlined scope by Advisory Partner. Where work methodologies have been suggested in this report, these do not represent a full description of works required or the basis for a specification, i.e., they are only indicative of the type of necessary works.

The estimate has been prepared for the purpose of this study and must not be used for any other purpose. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. PAEMAC does not represent, warrant, or guarantee that the works can or will be undertaken at a cost which is the same or less than the Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the works are at the planning stage, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. Please contact PAEMAC if any information or clarification is required.

Photos used in this document have been sourced from the internet and other publicly available sources and have been included for illustration purposes only.

2 Purpose

DRX have produced a Study Document titled “Northern Silica Sand Project Scoping Study Summary” (June 2023). The Study Document details various costs associated with the project including the marine component. PAEMAC have been engaged by Advisory Partner Pty Ltd to review and provide an independent report (BoE) on the capital expenditure required to construct the marine component (only) of the DRX project which is the subject of the study document.

For the avoidance of doubt the marine component consists of those items detailed in Figure 2. This report details the assumptions and methodology used to develop the construction cost estimate for the marine component at Cape Flattery in Far North Queensland (Figure 1) namely:

- Construction of a new rock wharf; and
- Extension of the existing Port of Cape Flattery (PCF) shiploader jetty.

The PCF jetty is owned by Ports North (PN) and is operated by Cape Flattery Silica Mines Pty Ltd (CFSM). The existing PCF consists of a 220 metre, single trestle jetty and conveyor running from the mine to a 220m offshore berth and ship loader. There is also a general-purpose wharf for the import of fuel and other supplies for the mine and for the mooring of two line boats which assist in ship berthing.



Figure 1: Site Location

As indicated within the Study Document, the proposed new development will be undertaken in a staged approach (Figure 2):

- Phase 1 involves the construction of a rock wharf to the west of the existing PCF jetty with a conveyor and shiploader system outloading onto 8,500t transshipment barges. The rock wharf will also include a concrete roll on – roll off (RORO) facility to handle logistics for the mining operation. This is expected to have an outloading capacity of 3 million tons per annum (Mtpa).
- Phase 2 is the extension of the existing PCF jetty to allow for 55,000t bulk carriers to moor directly to the jetty and be loaded by shiploader. This phase is expected to have an outloading capacity of 5 Mtpa. The wharf extension will be constructed using piled foundations with a steel truss deck structure to support the conveyor system. Phase 2 is expected to commence operations 3 years after construction of Phase 1.

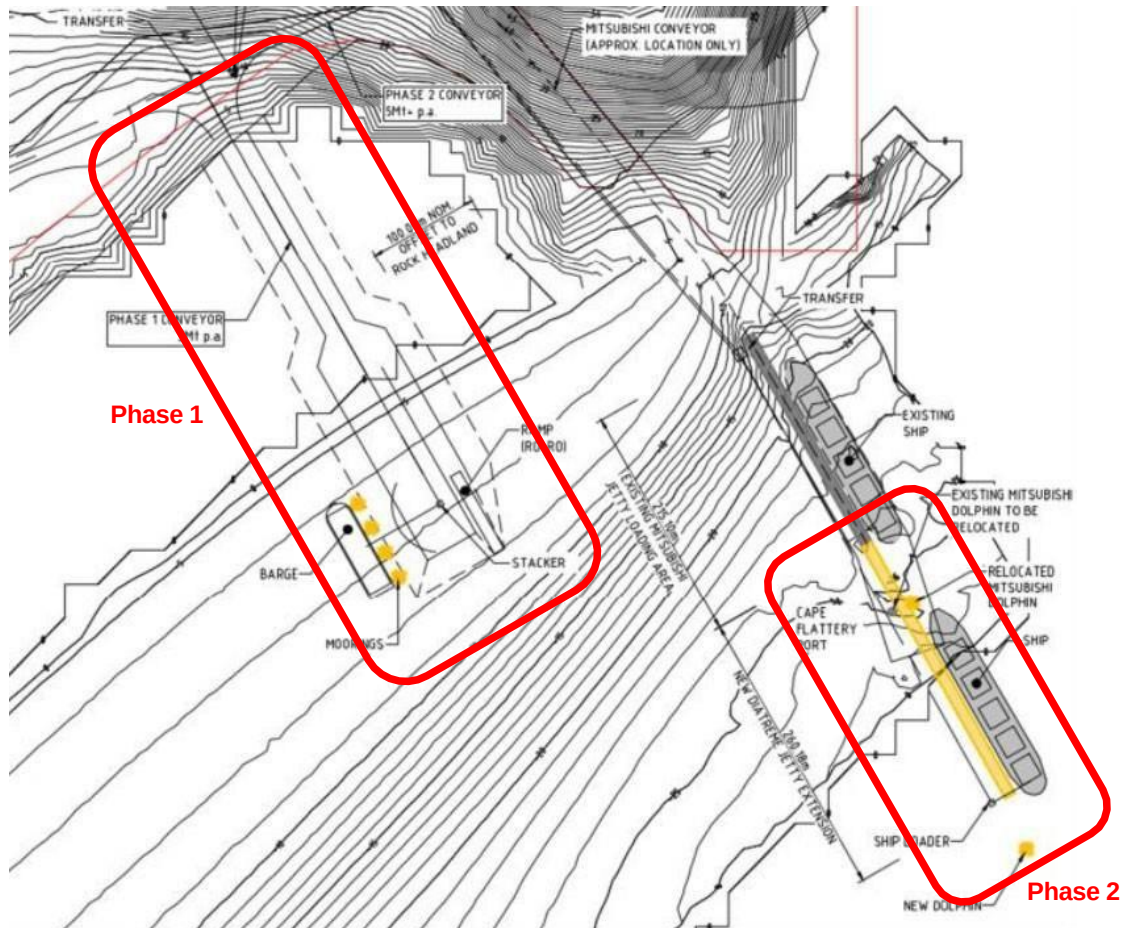


Figure 2: Site plan and general overview of phased construction approach

3 Terminology/Abbreviations

Table 1: Abbreviations

Acronym	Meaning
AUD	Australian Dollars
CAPEX	Capital Expenditure
Base Estimate	Estimated costs excluding contingency
BoE	Basis of Estimate
CFS	Cape Flattery Silica (Metallica Minerals)
CFSM	Cape Flattery Silica Mines (Mitsubishi Corporation)
Contractor	Contractor, Supplier
DRX	Diatreme Resources Limited
DWT	Deadweight Tonnage
EPCM	Engineering, Procurement and Construction Management
EWP	Elevated Work Platform
FEL	Front End Loader
GST	Goods and Services Tax
HAT	Highest Astronomical Tide
HLS	Heavy Lift Ship
LAT	Lowest Astronomical Tide
MOF	Material Offloading Facility
MSL	Mean Sea Level
Mtpa	Million tons per annum
MTO	Material Take-Off
OPEX	Operational Expenditure
PCF	Port of Cape Flattery
PN	Ports North
QLD	Queensland (AU)
RORO	Roll on Roll off
SEMP	Self-Elevating Modular Platform
SIMOPS	Simultaneous Operations
Study Document	Northern Silica Sand Project Scoping Study Summary (June 2023) by DRX
SOW	Scope of Work
TOS	Top of Steel
TSV	Trans-Shipments Vessel
WBS	Work Breakdown Structure

4 Estimate Scope

The Estimate is a Class 5 estimate in accordance with the principles of The Association for the Advancement of Cost Engineering (AACE) Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries.

The construction estimate is based on the preliminary concept contained within the Study Document for the rock wharf and jetty extension and associated works (Figure 3). In developing this report, a number of assumptions have been made on methods, design and construction which is consistent with the class of estimate.

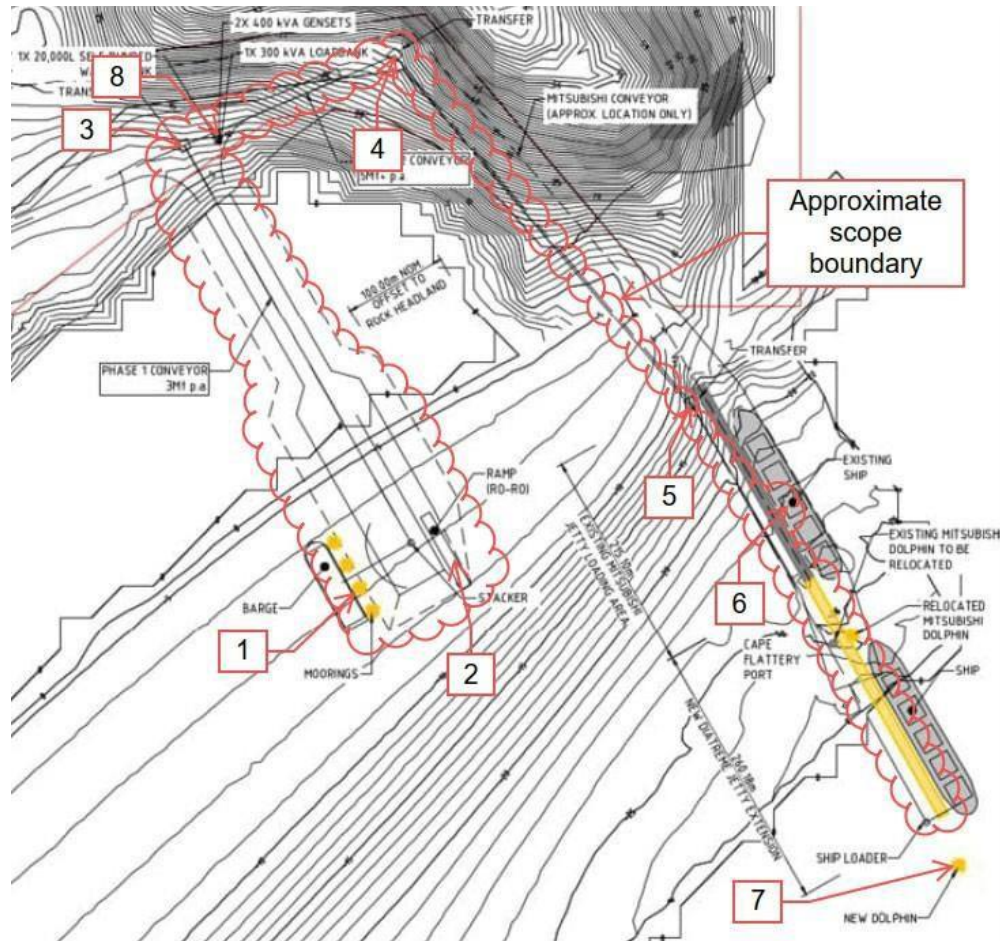


Figure 3: Scope of estimate

The scope of work is summarised as follows with reference to Figure 3:

- Phase 1: Construction of new rock wharf to the west of existing PCF jetty.
 - Transport of quarry fill material to site.
 - Construction of rock wharf.
 - Local winning of fill material.
 - Transport and installation of rock armour.
 - Construction of transshipment barge mooring [1].
 - Construction of concrete RORO facility [2].
 - Installation of conveyor back to the land side transfer tower, including transfer tower shown at [3]. This transfer tower forms the battery limit of material handling costing.
 - Reticulation of power and water from on-site generation and water storage/treatment [8].

Construction of Rock Wharf and PCF Extension – Basis of Estimate

- Extension of existing PCF wharf
 - Construction of new conveyor support trestle structure, incl. transfer towers [4, 5].
 - Relocation / replacement of existing dolphin [6].
 - Construction of wharf extension using piles and modular steel superstructure.
 - Construction of 1 x mooring dolphin [7].
 - Construction of 5 x berthing dolphins incl. fenders, bollards and quick release hooks.
 - Fabrication, delivery and commissioning of shiploader.
 - Reticulation of power and water from on-site generation and water storage/treatment [8].

The estimate includes direct costs to construct the Project under a Construct Only contracting model with the works expected to be completed by specialist contractors engaged directly by the Owner.

The estimate includes the direct costs to deliver the Works:

- Contractor preliminaries, mobilisation and demobilisation.
- Construction of shiploader jetty and dolphins using marine equipment.
- Supply and delivery of shiploaders.
- Land-based construction of abutments.
- Engineering design and support during construction.
- Temporary works and safe access platforms.
- Pre/post construction hydrographic survey.
- Contingency.

The estimate is based on the following inputs:

- Diatrema Resources ASX Announcement: Positive Scoping Study for Northern Silica Project strengthens development plans dated 14/06/2023.
- Diatrema Resources Northern Silica Sand Project Scoping Study Summary dated June 2023.
- Queensland Land Registry Sublease 718758708 dated 21/05/2018.
- As-built drawings CF-S-005(3), -022(3), 051(5).
- 2001 upgrade works as-built drawings 7681-(101 to 110).
- Email communication between dated 01/03/2024.
- Tide data from AusTides Cape Flattery (Australian Hydrographic Office).
- Maps from Queensland Globe (State of Queensland 2023).
- Ports North Annual Report 2022-23.
- Department of Transport and Main Roads Port Procedures and Information for Shipping - Ports of Cape Flattery, Cooktown and Port Douglas (January 2024).
- Ports North Long Term Maintenance Dredging Management Plan, Port of Cape Flattery.

Exclusions from the estimate include:

- Owner costs, including:
 - Project management and contract administration.
 - Working capital.
 - Operating costs.
 - Costs incurred due to losses in productivity during construction.
 - Finance and escalation.
 - Environmental approvals.
 - Sunk costs for studies or investigations.
- Dredging in any form.
 - Phase 1: Long length of rock wharf reaches water of sufficient depth for transshipment vessels (TSV).
 - Phase 2: Per Ports North document “Long Term Maintenance Dredging Management Plan – Port of Cape Flattery”, “The natural deep-water location, and coastal hydrodynamics are sufficient mechanisms to avoid the need for maintenance dredging.”
- Transshipment vessels, permanent cyclone moorings, offshore moorings, tugs and line boats.

Construction of Rock Wharf and PCF Extension – Basis of Estimate

- Approvals (environmental, state and/or federal).
- Access roads, haul roads, and supporting infrastructure.
- Demolition (other than the existing Mitsubishi mooring dolphin)
- Site rehabilitation or remediation.
- Removal of Phase 1 rock wharf after completion of Phase 2.
- Land side feed conveyors outside of the scope boundary shown in Figure 3
- Power generation and water storage/treatment (assumed hired and maintained as OPEX cost).
- Land side utility infrastructure (electricity, water, communication, etc.) outside of the scope boundary shown in Figure 3.
- Escalation.

5 Construction Methodology

5.1 Assumptions

The following assumptions were made during the build-up of the methodology:

- The new wharf extension is accessible by a heavy lift ship (HLS).
- While there is a 4x4 track to the site, all construction plant and materials are to be brought in by landing craft and barges.
- 1/3rd of the fill material for the construction of the rock wharf will be imported from commercial quarry operations near Cairns, while the remaining 2/3rds of core materials will be won locally from borrow pits.
- Rock wharf batter slope was assumed to be 1:1.5.
- No sealing (asphalt/concrete) would be installed on the rock wharf top surface. A capping layer of 0.5m thick imported rock has been included.
- Provision has been made for accommodation for Contractor's workforce on or near to site.
- Camp and office accommodation mobilized to site via landing craft ex. Cairns.
- Staff will fly in and out via helicopter (noting use of existing airstrip is not possible, and transit times via vessel too long).
- Battery limits as per boundary indicated in Figure 3.
- The shiploader in Phase 1 was assumed to be purchased and retain 50% of its value for resale after three years.
- No allowance was made for the removal of the rock wharf and/or conveyor system (Phase 1) after Phase 2 comes online.
- Nil provision for nightshift construction works.
- Nil provision for escalation.
- No legislative impediments to construction (such as environmental license conditions).
- Labour, staffing and plant costs based on 2024 rates for resource project works.
- Working calendar assumed at 2 in 1 roster & 7 working days per week.
- Provision included for fuel at \$2.10/litre.

5.2 Site Constraints

5.2.1 Access

Road access to the site is understood to be limited to a 4x4 track. For this reason, all material delivery will take place via water, with marine plant being mobilised from Cairns or Townsville.

Land-side plant for the construction of the rock wharf (e.g., articulated dump trucks, excavators, front-end loaders) would also need to be mobilised via water, likely via landing barge. A temporary facility will need to be constructed for the first delivery of earthmoving equipment (Figure 5 and 5).

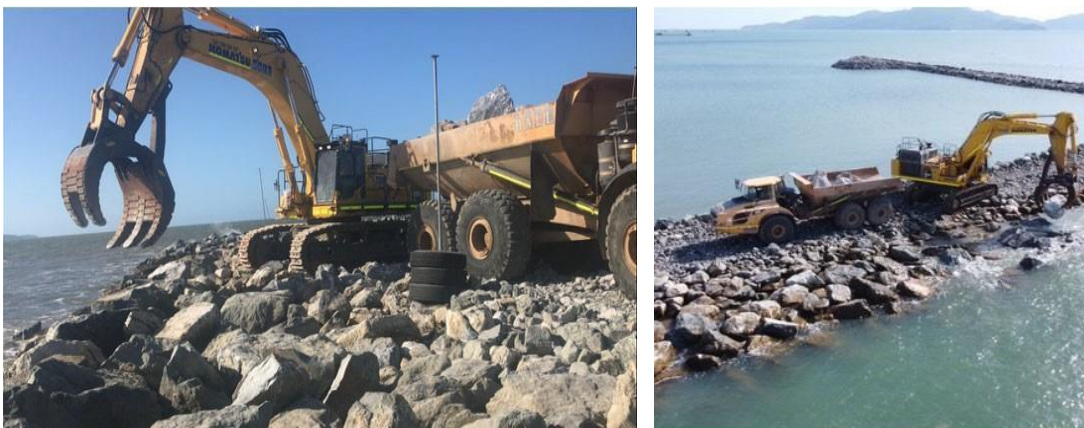


Figure 4: Construction of the offloading facility

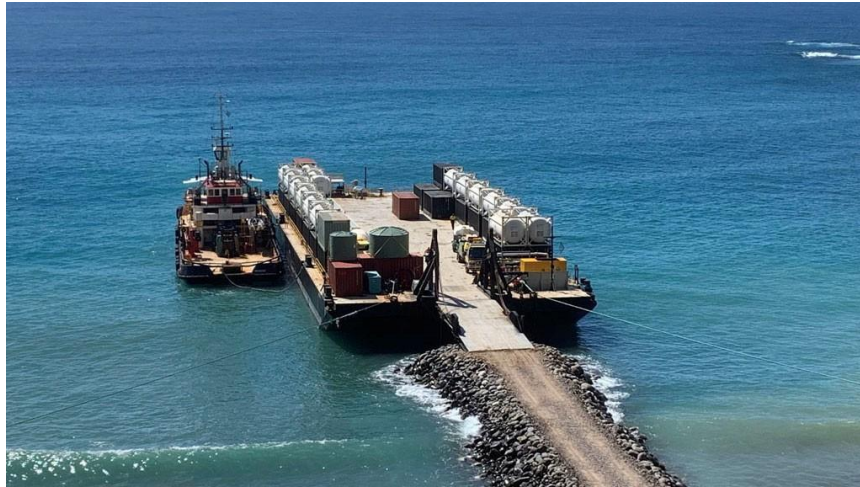


Figure 5: Temporary barge offloading facility

Delivery of the wharf extension modules and shiploader will be via Heavy Lift Ship (HLS) (Figure 6).



Figure 6: Modulated wharf construction using HLS

All crew will be flown in and out via helicopter (Figure 7) operating from a temporary helipad, carrying 6 crew per flight.



Figure 7: Helicopter used for crew transfer to and from site

5.2.2 Water Depth

Water depth at LAT along the existing wharf increases from 17m at BD-5 to 24m at MD-1. Depth at the outermost tip of the rock wharf was taken at 8m at LAT.

5.2.3 Tidal Range

The maximum tidal range is 3.0m, but 95% of the daily variation should fall within twice the standard deviation, between 0.34m and 2.57m above LAT (Figure 8).

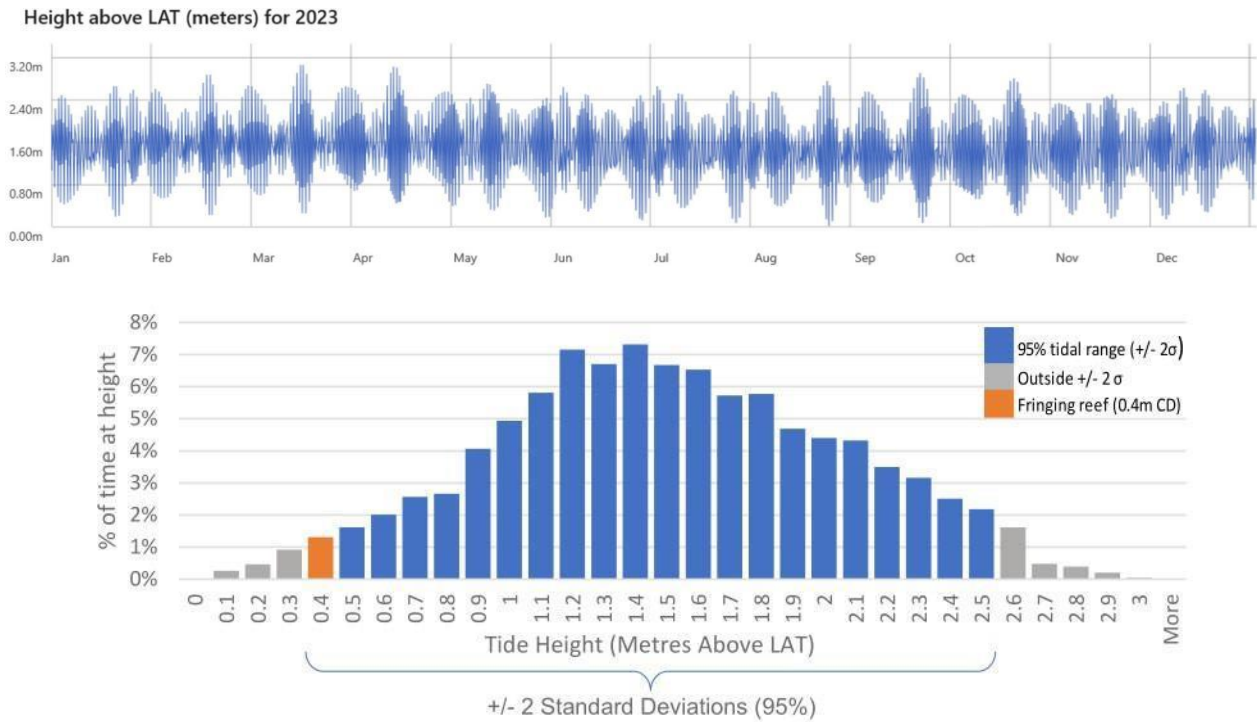


Figure 8: Forecast tidal range for Cape Flattery, 2023. Metres above LAT (0m LAT = 0m CD) (Source: AusTides, Australian Hydrographic Office)

5.2.4 Cyclones and Weather

The site falls inside the eastern cyclone zone, with the season typically running from November to April,

Construction of Rock Wharf and PCF Extension – Basis of Estimate
although tropical cyclones can and do occur outside of this period. The long-term average number of

tropical cyclones in this zone using data from 1969-2022 is 4, with a 76% chance of fewer storms occurring (source: BOM Australian Tropical Cyclone Outlook for 2023-24). Provision of cyclone moorings for all marine construction plant on site during this period would be required.

Local annual wind speed also suggests less weather loss would be experienced between October and March (Figure 10). However, this does coincide with cyclone season, so stand-down allowance and suitably rated moorings would need to be included. Previous project experience under these conditions suggests a 15% weather loss is to be expected (averaged over a continuous year). This represents time lost due to a combination of poor weather and seastate caused by rain, wind, swell, waves and other adverse conditions.



Figure 9: Prevailing wind direction, 2022
(Source: WillyWeather Cape Flattery)

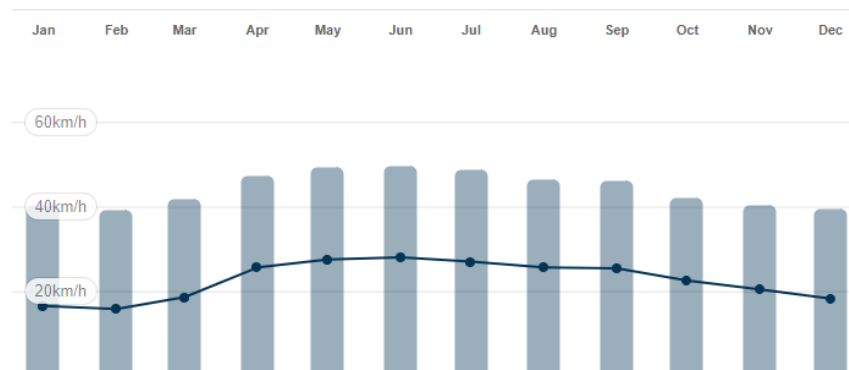


Figure 10: Max and average wind speed, 2013-23 average
(Source: WillyWeather Cape Flattery)

5.3 Project Schedule

The estimate has been aligned with a high-level schedule of works based on a working calendar of a 2 in 1 roster with 7 working days per week.

Phase 1 construction of the rock wharf has been assumed to take 50 weeks on site from mobilisation to completion (not including any preliminary works and/or procurement).

Phase 2 construction has been assumed to take 60 weeks on site from mobilisation to completion (also excluding any preliminary work and/or procurement).

5.4 Phase 1 - Transhipment Facility

5.4.1 Rock Works

The proposed rock wharf is 450m long and 35m at the apron, extending into water depths of approximately 8m below LAT (Figure 11) with dimension interpolated from the Study Document. The wharf is assumed to consist of a crushed rock core, protected by geofabric followed by filter and armour rock layers (Figure 12). The assumed fill specification consists of 1/3rd imported rock fill material, and 2/3rds sand material locally won on site (Figure 13). The outer primary and secondary armour material is assumed as all imported. Provision was made in the estimate for a surveyor and an on-site laboratory for QA/QC during construction.



Figure 11: Interpolated approximate layout for rock wharf. Tide shown at LAT.

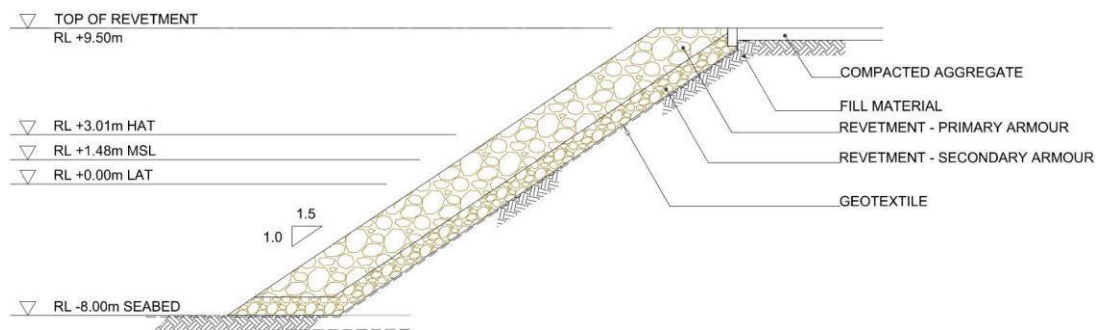


Figure 12: Assumed cross section of wharf construction showing fill and armour

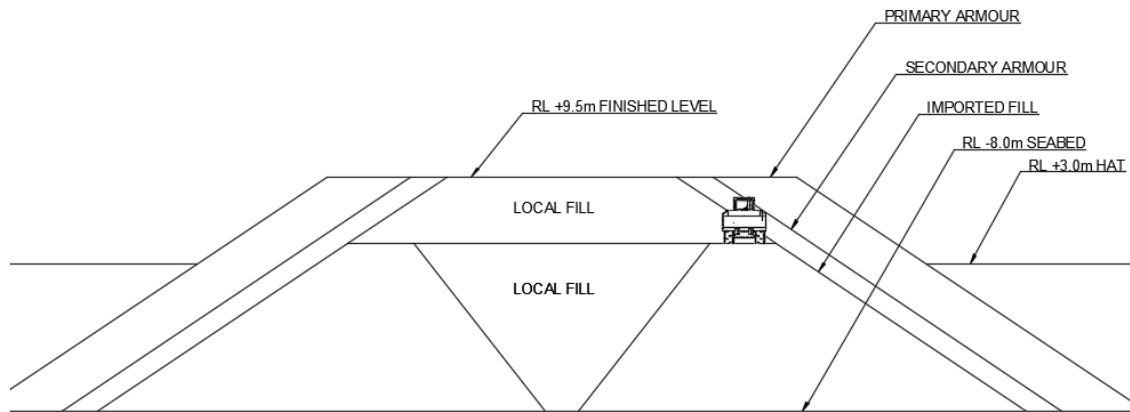


Figure 13: Assumed cross section of rock wharf illustrating proposed construction methodology

Imported materials will be brought in on rock barge from Cairns using 4 x rock barges, each bringing 2500t - 5000t to site per load (Figure 14). These barges would likely need to be sourced from Singapore. A temporary loadout facility will need to be constructed from locally won materials to enable offloading of rock barges. A small landing craft would be used to offload plant to create the loadout facility and a temporary helipad. As an indication of the complexity of this operation, this equates to over 120 barge loads of rock materials.



Figure 14: Typical rock barge being loaded by front-end loader

It is noted that the Phase 1 rock load out concept would benefit from significant design refinement and value engineering. The quantity of rock to be imported, coupled with the remote, environmentally sensitive location means construction costs are significant. Without specific design details for Phase 1 assumptions have been used to develop the basis of costing. The site is exposed to prevailing weather conditions and susceptible to both erosion and coastal processes. No outer breakwater, overtopping protection or revetment structure has been indicated as required within the Study Document, however without protection from seastate, vessels using the facility are susceptible to the prevailing site conditions. As such no additional provisions for seastate protection have been considered within the BoE.



Figure 15: Typical rock barge being offloaded by front-end loader

Construction of the wharf is completed by creating two bunds of imported crushed rock material (imported to ensure quality). These bunds are pushed out from landside using a combination of front-end loaders (FEL), excavators and articulated dump trucks. The bunds are then filled in and the entire wharf brought to final height using locally won sand material to limit the quantity of imported material. Once the core has been completed, it is covered by geofabric followed by a layer of secondary armour rock. Finally, a layer of appropriately sized armour rock is installed. The top surface of the rock wharf consists of compacted aggregate, with compaction achieved using a pad roller.

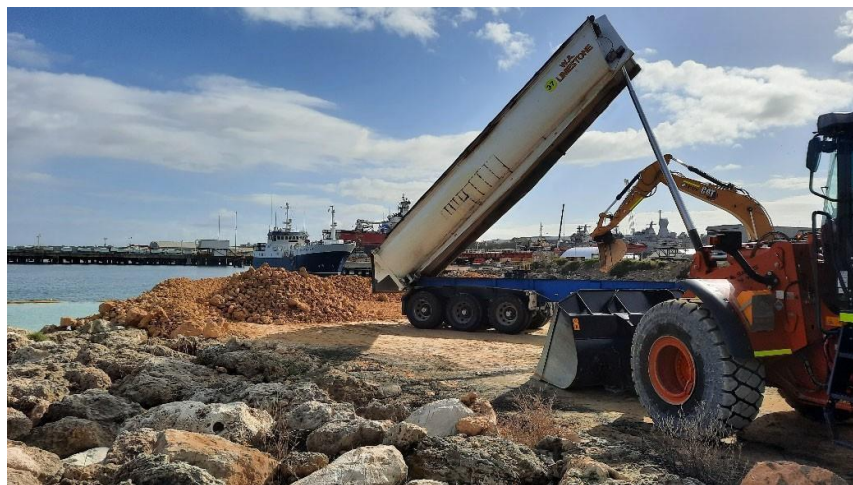


Figure 16: FEL, excavator and dump truck working to place fill for typical armoured rock wharf



Figure 17: Installation of geofabric on top of fill



Figure 18: Installation of primary and secondary rock armour on top of geofabric

5.4.2 Transhipment Berthing Structure

The single TSV berth will be constructed on the western edge of the rock wharf. It was assumed to follow the structure of a similar facility (Figure 19) suitable for 8,500 DWT self-propelled barges. The berth will consist of 4 vertical piles braced back to the rock wharf with struts, anchored into the wharf via concrete blocks. Fenders will be mounted to the front face of the vertical piles.



Figure 19: Reference transshipment barge berth

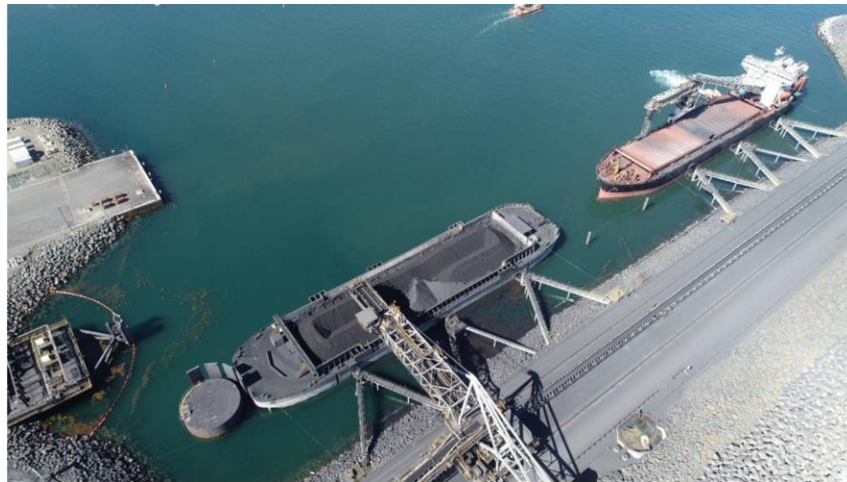


Figure 20: Reference transshipment barge mooring structure

Installation of the 4 mooring piles would be completed using a piling frame mounted to a Self-Elevating Modular Platform (SEMP) (Figure 21). The frame is fully manoeuvrable and is fitted with two installation gates which secure the pile in location and ensures the pile is installed within construction tolerances.

The land-side concrete works necessary for anchoring the struts will be completed using a small concrete batch plant (Figure 22). Struts will be installed using a crane mounted on the SEMP, in conjunction with an Elevated Work Platform (EWP) and a access systems attached to the piles.



Figure 21: SEMP used to install mooring piles.



Figure 22: Small mobile concrete batch plant

5.4.3 Landing Ramp

The concrete landing ramp extends from the southeastern corner of the rock wharf for access by RORO vessels or landing craft. The ramp is constructed in-situ. The ramp is required to allow additional port logistics access for mining operations which has been interpreted to mean a RORO vessel capable of vessel-to-shore transfer of track and wheel mounted mining equipment as listed in Table 4-3 of the DRX Scoping Study.



Figure 23: Landing ramp for RORO vessel or landing craft

5.4.4 Shiploader

The shiploader is assumed to be a radial type with an extendable boom for TSV loading (Figure 24). The conveyor will feed to the shiploader pivot hopper before being loaded onto the barge. The shiploader was assumed to be purchased for the Phase 1 period (i.e. 3 years) and sold at 50% value upon completion of the Phase 2 works.

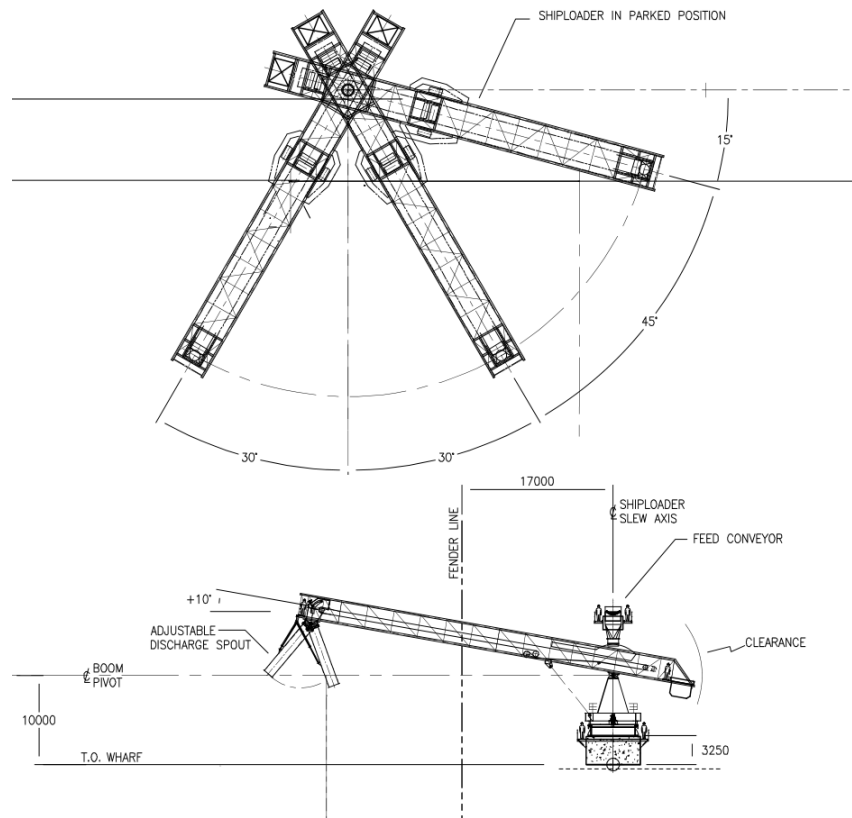


Figure 24: Typical radial shiploader for barge loading

5.4.5 Site Office and Camp Facilities

A construction camp in the vicinity of the construction site (Figure 25) has been included in the estimate for the full Phase 1 construction duration (Table 2). These facilities are on site for the full Phase 1 construction duration. All facilities are mobilised to site using a landing craft ex. Cairns (Figure 26) onto the temporary loadout facility.



Figure 25: Typical construction camp using transportable buildings

Table 2: Breakdown of temporary site office and camp facilities

Site Facilities	Description	Quantity
Main Office	12X6-Office	1
Cribs	12X3-Cribs	2
Toilet	Toilet	2
Access Stairs	Access-Stairs	1
Water Tanks	5000l Water Tanks	2
Waste Tanks	5000l Waste Tank	1
Water Pumps	Pumps (incl. UV filter)	2
Power	50Kva Genset	1
Diesel	2500l Diesel Tank	1
Bunded Fuel Storage	Fuel Tank Bund & Pump	1

Camp Facilities	Description	Quantity
Accommodation	4 Bed Ensuite	8
Bathrooms	General	4
Kitchen	Commercial	1
Refrigeration	20ft Container	1
Dry Stores	20ft Container	1
Maintenance Store	20ft Container	1
Luggage Store	20ft Container	1
Laundry and Line Store		1
Rec. Room/Wet Mess		1
Gym		1
Office	12X6-Office	2
Waste Water Treatment Plant		1
Water Storage Tanks	5000l Water Tanks	2
Elec Generator Package	50Kva Genset	1
Diesel	2500l Diesel Tank	1



Figure 26: Typical landing craft used for camp mobilisation and on-going weekly supply

5.5 Wharf Extension

The Port of Cape Flattery wharf extension necessary for Phase 2 of the project is assumed to be constructed using a modern modular philosophy, with piles being installed and braced prior to delivery and installation of pre-made deck modules. Once installed and shiploader rails aligned, the shiploader can be delivered and commissioned. The feed conveyor will require a separate structure due to lack of space on the existing wharf.

5.5.1 Piling

Piling will be completed using a SEMP equipped with crane and piling frame (Figure 27). The SEMP will work in conjunction with a storage barge and a Multicat style workboat. The water depth and likely pile size suggest the SEMP will need to have a capacity of 500t approximately.



Figure 27: Pile top drill rig and piling frame mounted to SEMP

Piling will be completed using the "drive, drill, drive" (DDD) piling technique consistent with the methods used previously in constructing the existing PCF wharf (Figure 28). This method is used in situations where conventional pile driving methods might encounter challenges such as hard soil or bedrock. This method was assumed to be necessary due to the low pile penetrations noted in the "Berthing Dolphin Upgrade" drawings ($\pm 3\text{m}$). This technique involves a three-step process:

1. Drive: Initially, the pile is driven into the ground using a hydraulic or vibratory hammer. This initial driving phase aims to penetrate the soil or soft rock layer to a certain depth. Once the pile reaches a layer that cannot be penetrated effectively using conventional driving methods, the process moves to the next step.
2. Drill: In the second stage, a drill rig is used to create a borehole or pilot hole into the hard layer of soil or rock. This drilling process involves using drilling equipment mounted to the pile top (Figure 28), to penetrate the hard layer. The borehole is typically slightly wider than the pile diameter to allow for easy insertion of the pile.
3. Drive: Once the borehole is drilled to the desired depth, the pile is inserted into the hole. The pile is then driven further into the ground using pile driving equipment. This driving phase ensures that the pile is securely seated within the drilled hole, providing the necessary stability and load-bearing capacity for the construction project.



Figure 28: Pile top drill rig used for DDD pile installation

Wharf piling is expected to take 24 weeks to install the wharf piles. Following completion of the piling, the piles will be braced using temporary bracing, and walkways installed to allow for pile top access (Figure 29).



Figure 29: Pile bracing and walkways installed

5.5.2 Mooring Dolphin Relocation

In order to mitigate the disruption caused by the relocation of the Mitsubishi dolphin on current Port operations, a new dolphin structure has been budgeted for. This facilitates a faster transition between using the existing dolphin to the new dolphin upon its completion and minimises impact on existing shipping operations. Subsequently, the old dolphin can then be dismantled and removed, with the piles cut at the seabed level. However, due to the location, construction of the new dolphin will still be impacted by shipping operations, necessitating the periodic relocation of the SEMP to accommodate the passage of incoming and outgoing vessels, as discussed in Section 13: Interaction with Existing Port Infrastructure and CFSM Operations.

Allowance was made for 50% of the assumed 6 raked piles (based on existing dolphin, Figure 30) to be anchored, with the remaining 50% to be installed using the DDD technique. This was based on the limited pile penetration during construction of the main PCF wharf. Following installation of the 6 piles, the pile caps and headstock can be installed prior to the installation of the dolphin deck and mooring bollards/quick release hooks. Furniture such as handrails and ladders can then be installed.

The new mooring dolphin as well as the 5 x new berthing dolphins will be completed using the same methodology. The mooring and berthing dolphins need to be completed prior to the arrival of the HLS to allow it to moor safely.



Figure 30: Mooring dolphin structure consisting of 6 raked piles

5.5.3 Deck Installation

The 5 x prefabricated deck modules will be delivered to site on an HLS, which will be berthed using the newly constructed mooring and berthing dolphins (Figure 31). The deck modules can then be lifted into position using the HLS cranes before being aligned and fully welded.



Figure 31: HLS transporting prefabricated modules



Figure 32: HLS installing prefabricated deck modules

5.5.4 Conveyor (Marine)

The existing PCF access jetty and roadway does not have sufficient space to install an additional conveyor (Figure 33), and as such a new conveyor structure is required and is expected to approximately follow the red line shown (Figure 34). Allowance was made in the estimate for construction of a new piled trestle parallel to the existing jetty (Figure 35). This red line conveyor may be similar to the smaller conveyor jetty shown closer to land (used by Mitsubishi). Piles will be installed using the same technique as the wharf extension, albeit using smaller piles. The conveyor structure will be brought in as modules on the same HLS used to transport the deck modules.



Figure 33: Lack of space on existing conveyor structure for a second conveyor.



Figure 34: Potential location for Phase 2 conveyor



Figure 35: Concept for additional conveyor parallel to jetty structure

5.5.5 Conveyor (Landside)

Simply supported reinforced concrete footings have been assumed to be suitable for the purposes of supporting the landside conveyor.



Figure 36: Concept conveyor on footings feeding radial shiploader to TSV

5.5.6 Shiploader

The shiploader will be designed and built offshore specifically for the application. The entire shiploader will be brought in as a complete unit on an HLS and lifted directly onto the rails on the deck using the HLS cranes (Figure 37).



Figure 37: HLS lifting a fully assembled shiploader

6 Estimate Basis and Methodology

6.1 Estimate Basis

The Cost Estimate is:

- Developed to produce an AACE Class 5 Capital Cost Estimate (Figure 38).
- Based on an Owner-led direct execution framework.
- Based on basic layout as illustrated in Diatrema Resources Northern Silica Sand Project Scoping Study Summary (Study Document).
- Estimate base date is Q1, 2024.
- Expressed in Australian Dollars.
- Exclusive of GST.

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges at an 80% confidence interval
Class 5	0% to 2%	Functional area, or concept screening	SF or m ² factoring, parametric models, judgment, or analogy	L: -20% to -30% H: +30% to +50%

Figure 38: Class 5 estimate (Source: 56-08R AACE Cost Estimate Classification System)

6.2 Estimate Methodology

The estimate methodology uses:

- Quantities estimated from drawings and dimensions provided and built-up using knowledge of the construction methodology and modern wharf design philosophies.
- Direct workhours based on first principles build-up of crews and production cycles.
- Labour crew rates developed using a marine contractor's labour agreement.
- Contractor distributables determined from first principles and estimated based on durations.
- Labour, plant and equipment based on market rates and recent budget quotations.
- A contingency allowance of 30% has been adopted.

6.3 Estimating Software

The estimating software used to develop the Estimate is Expert Estimation.

7 Estimate Summary

The capital cost estimate for each project phase is summarised below with complete detail attached in the Estimate Report (see Appendix A. Estimate Submission Schedule and Summary).

7.1 Phase 1 – Rock Wharf

Table 3 outlines the financial breakdown for Phase 1, detailing both direct and indirect costs in AUD. Direct costs encompass contractor preliminaries, rock works, marine structures, and product handling, totalling \$107,200,000. Indirect costs, including engineering and temporary facilities, amount to \$16,100,000. Additionally, a contingency provision of \$37,000,000 is allocated, bringing the total project expenditure to \$160,300,000. The project cost breakdown is illustrated in Figure 39.

Table 3: Phase 1 Estimate Summary

Phase 1 Transhipment Facility	Amount (AUD)
Direct Costs	
Contractor Preliminaries	\$23,100,000
Rock Works	\$64,700,000
Marine Structures	\$5,600,000
Product Handling	\$13,800,000
Indirect Costs	
Engineering	\$3,800,000
Temporary Facilities	\$12,300,000
Contingency	
Contingency Provision	\$37,000,000
Total	\$160,300,000

7.2 Phase 2 – Wharf Extension

The Phase 2 estimate is summarised in Table 4, detailing direct and indirect costs, as well as contingency in AUD. Direct costs include contractor preliminaries, berthing and mooring dolphins, the jetty extension, approach jetty structure, product handling and loadout, and services, totalling \$169,200,000. Indirect costs, encompassing engineering and temporary facilities, amount to \$12,500,000. Additionally, a contingency provision of \$54,500,000 is included bringing the total project expenditure to \$236,200,000.

Table 4: Phase 2 Estimate Summary

Phase 2 Wharf Extension	Amount (AUD)
Direct Costs	
Contractor Preliminaries	\$44,900,000
Berthing and Mooring Dolphins	\$19,500,000
Jetty Extension	\$35,700,000
Approach Jetty Structure	\$13,400,000
Product Handling and Loadout	\$42,600,000
Services	\$13,100,000
Indirect Costs	
Engineering	\$5,900,000
Temporary Facilities	\$6,600,000
Contingency	
Contingency Provision	\$54,500,000
Total	\$236,200,000

Construction of Rock Wharf and PCF Extension – Basis of Estimate

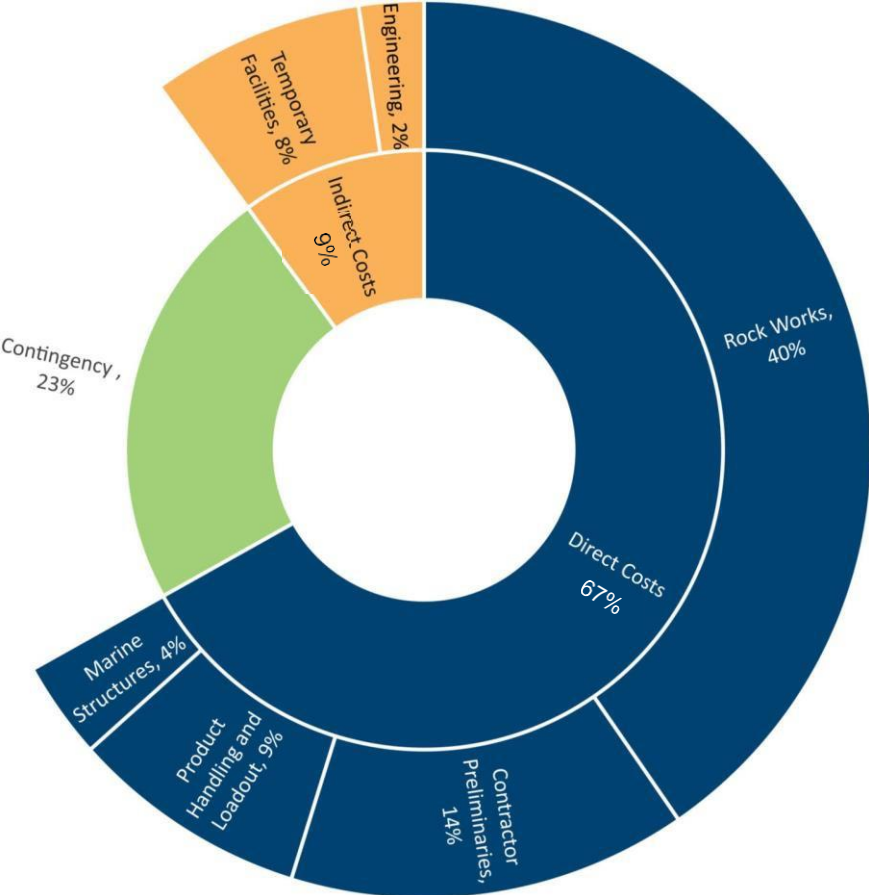


Figure 39: Phase 1 estimate breakdown

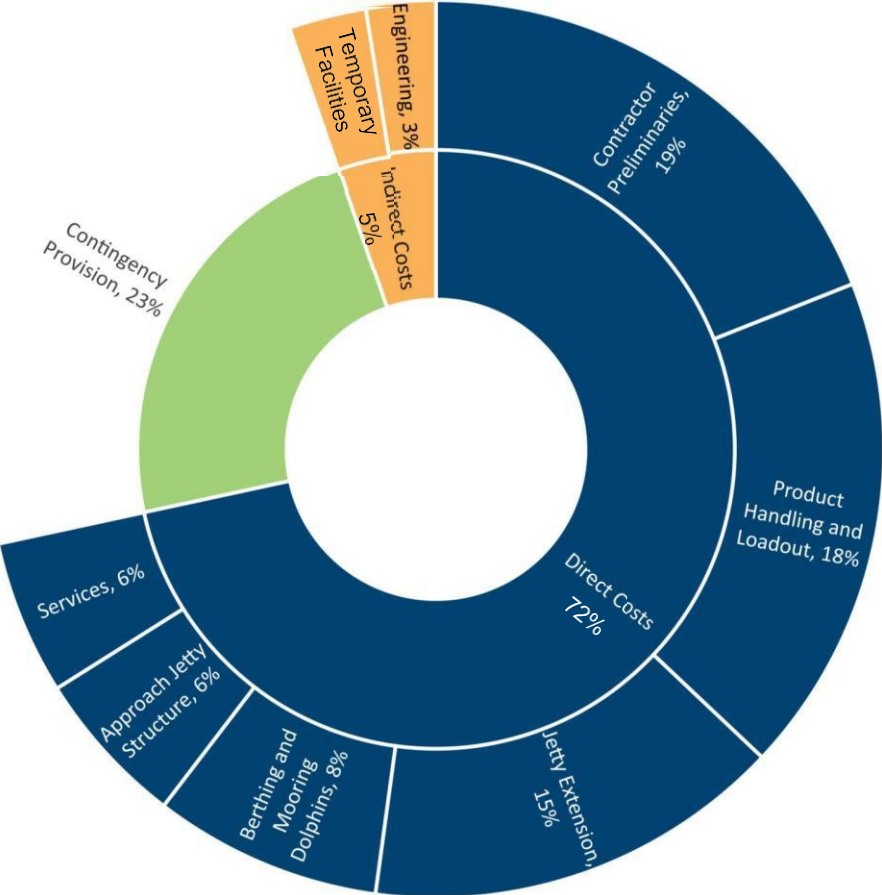


Figure 40: Phase 2 estimate breakdown

8 Direct Costs

8.1 Quantity Development

The general approach to the estimate quantification and scope has been:

- Construction scope has been quantified from the details referenced within this report.
- Quantities inferred from concept drawings and reference to other projects.
- Landside conveyors and abutment construction has been assumed as no detail has been supplied.
- Quantities were expressed measured neat in place. The estimate makes additional allowances for sundries and waste.

8.2 Pricing Development

Table 5 outlines the source of pricing for key resources.

Table 5: Estimate cost basis

Discipline	Description
Marine plant	Database rates from recent projects Q12024.
Cranes and support equipment	Database rates from recent projects Q12024.
Construction costs, equipment and labour	First principles cost estimate based on resource costs applied against schedule of works. Productivity rates are from PAEMAC database and recent marine projects with losses allowed for weather and interface.
Construction materials	Database rates from recent projects Q12024. First principles cost estimate based on estimated quantities.
Contractor Preliminaries	First principles cost estimate based on resource costs applied against schedule of works.

8.3 Site Labour

8.3.1 Labour Rate

Labour rates were calculated using a representative Enterprise Agreement for a marine contractor for FIFO work in rural Queensland.

Calculations are based on an average 84-hour week with 12-hour day x 7 working days / week.

These base rates include site allowances, location allowance, long service leave, annual leave, sick leave, leave loading, public holidays, payroll tax, workers compensation and shift allowance.

The labour cost rate in the estimate includes the costs for:

- Flights (based on industry standard charter rates)
- Accommodation and meals (Phase 1 based on mobilisation/demobilisation and industry standard 30-person mobile camp for similar accommodation. Phase 2 based on use of existing mine camp).

8.3.2 Site Construction Work Hours

The daily output of each crew is determined using task durations completed during an effective day calculation. The effective day has been reduced to reflect the restricted access to the worksite and accounts for daily losses due to prestart toolbox talks and breaks.

8.4 Contractor Distributable Costs

The following items are directly calculated and allocated by task and duration to the specific line items within the Work Breakdown Structure:

- Contractors Project Management.
- Supervision.
- Insurance, guarantees and corporate indirects.
- Temporary facilities (office, crib and ablutions).
- Mobilisation and demobilisation.
- Construction plant and equipment.
- Indirect labour.
- Task specific and general craneage.
- Small tools and consumables.

The following indirect Contractor costs are distributed throughout the estimate and spread as a percentage across the calculated direct costs:

- Contractor's overheads and profit.
- Expected weather losses.

8.5 Owner Supplied Items

Supply items that have been identified as Owner supply and assumed free issue to Contractor:

- Land for Contractor laydown area, temporary camp and land-side access to site.
- Management of or integration with any PCF operations to provide Contractor access for Phase 2 Works.

These items are excluded from the Cost estimate. All other temporary, permanent materials and services required to undertake the Works are to be provided by Contractor.

8.6 Freight and Transportation

All materials (incl. waste) within the direct costs include transport from Port of Cairns, QLD.

Allowance has been included in the estimate for costs to transport plant and equipment between site and Port of Cairns, QLD using a combination of landing craft and towed barges.

8.7 Growth Allowance

Growth allowance considers changes to both quantity and cost to cover unknown but expected increases.

Growth allowance has been excluded in the assessment.

9 Indirect Costs

9.1 Engineering Design

Engineering costs associated with the construction works, including design, construction support, lift studies and design of temporary works have been included as Engineering Design and Support. This was calculated as 3.5% of the direct costs.

9.2 Owners Costs

Owner's costs have been excluded from this Estimate. These can include, but are not limited to:

- Permits and Statutory Approvals.
- Owners project procurement and management team.
- Corporate Management.
- Loss of operations, asset, revenue and profit associated with construction of the Works.

9.3 Goods and Services Taxes

Goods and Services tax has been excluded from the Estimate.

10 Contingency

Contingency is an allowance for uncertainty and risk in the estimate to cover undefined items of work that must be performed, or to cover elements of cost within the defined scope of the estimate that cannot be explicitly foreseen or identified at the time the estimate is being developed. The Class 5 estimate includes a Contingency allowance of 30%.

Key risk factors contributing to the contingency are summarised below:

- Specialist Contractor and plant scarcity.
- Site delays, including plant breakages and equipment failure.
- Weather and seastate.
- Staff and labour scarcity impacting cost and / or progress of the Works.
- Approval conditions and restrictions to work methods.
- Remote location.

11 Escalation

Escalation analysis is required to determine the amount of money necessary to compensate for cost increases due to occur from the base date of the estimate to the date of project completion.

Escalation has been excluded from the estimate.

12 Estimate Reviews

The following estimate reviews have been performed:

- Estimating internal review.
- Peer review for Client submission.
- Benchmarked against similar projects, making allowance for:
 - The Phase 2 construction location necessitates drilling and anchoring of piles, which is more costly than traditional piling.
 - The PCF location is remote and largely inaccessible from land, necessitating the transport of all construction plant, materials and temporary supporting infrastructure via sea, increasing costs.
 - Complex conveyor system with multiple transfer towers and additional supporting infrastructure required for Phase 2 increasing costs.

13 Interaction with Existing Port Infrastructure and CFSM Operations

Interaction issues with the existing Cape Flattery Silica Mine's (CFSM) infrastructure during construction will be unavoidable, noting the proximity of the construction to CFSM's wharf and the requirement to move the Mitsubishi mooring dolphin. The main risks associated with construction and operations interface are:

- 1) Phase 1 transshipping to bulk carriers moored at existing wharf.
- 2) SIMOPs interaction between Phase 2 construction and CFSM vessels.
- 3) Port operations following completion of Phase 2 construction.
- 4) Removal / relocating of the existing Mitsubishi mooring dolphin.
- 5) Parting mooring lines.

Phase 1 transshipping to bulk carriers moored at existing wharf

In the description of the Phase 1 operational concept, the DRX scoping study summary states that "The product will then be transhipped to bulk carriers anchored at the existing wharf".

The existing conveyor outloading capacity of 1300 t/hr¹ and average vessel capacity (52 264t) suggests that vessels will be on berth for 3 days (including arrival and departure times). Transfer from barge to moored vessel would therefore need to exceed a gross outloading capacity of 1300t/hr in order for the berth to have sufficient capacity (without impacting on current operations). Specific outloading capacity will need to be significantly higher to allow for TSV loading and turn-around time. Key risks would be:

1. Interaction/coordination with existing operations and management of shipping operations.
2. Operational capacity of TSV(s) and rate of transshipment outloading operations.
3. Weather limiting transshipment operations and TSV movement.
4. Capacity of existing dolphins to accommodate simultaneous mooring of bulk- and transshipment- vessels.

SIMOPs interaction between Phase 2 construction and CFSM vessels

Per Department of Transport and Main Road document Port Procedures and Information for Shipping, Ports of Cape Flattery, Cooktown and Port Douglas, "There are no tugs at the port. Ships anchors will be used extensively to assist berthing and unberthing."

The existing PCF approach (Figure 41) and lack of tugs available means the construction area for the Phase 2 extension is directly in the path of incoming vessels. This would likely mean that all construction activities would need to be coordinated with the shipping schedule to ensure the SEMP is not endangered by an approaching vessel. 2023 saw 58 vessels berth at Cape Flattery², averaging slightly more than 1 per week. This would likely have a significant impact on construction productivity due to the duration required to relocate the SEMP and associated equipment with every vessel arrival and departure.

Mitigation measures may include:

- The provision of tugs to assist in CFSM vessel berthing.
- Stand down of construction operations and relocation of construction equipment away from Port prior to vessel berthing and departure.

Port operations following completion of Phase 2 construction

Upon the completion of Phase 2 construction and the commencement of operations at both berths, the close proximity of the berths to one another will require re-evaluation of the current port approach and mooring strategy. Potential risk mitigation strategies could include the use of tugboats for every vessel arrival and departure. This will need to be assessed by Ports North.

¹ Ports North Long Term Maintenance Dredging Management Plan, Port of Cape Flattery

² Ports North Annual Report 2022-23

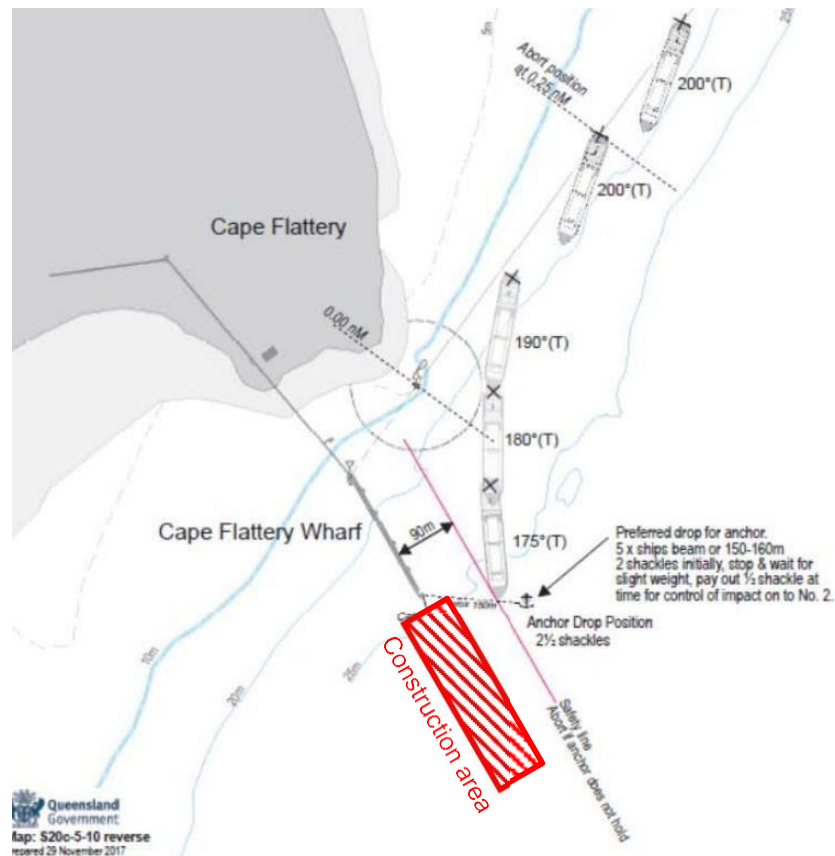


Figure 41: PCF approach and anchorage

Removal / relocation of the existing mooring dolphin

The existing PCF jetty mooring dolphins Mooring Dolphin 1 (MD1) and Breasting Dolphin 1 (BD1) are the southernmost dolphins used for berthing Panamax (or larger) vessels by CFSM. The proposed new jetty extension dissects the vessel mooring lines when berthed at the PCF. The extent of the interface with the works is shown in Figure 38.

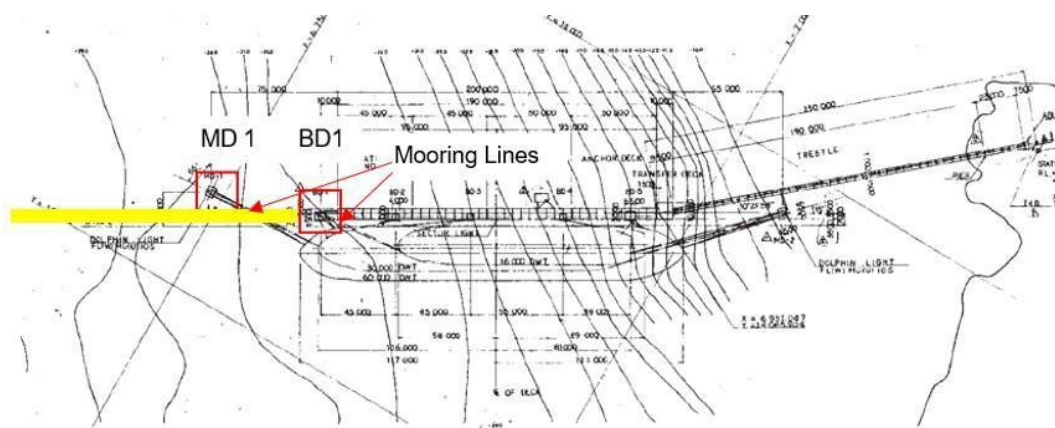


Figure 42: PCF Dolphins

As MD1 is located to the rear of the proposed new berth extension, the mooring lines attached to both the vessel at PCF Jetty and MD1 will dissect the proposed construction area / new berth extension. During the detailed design phase of the works, consideration will need to be given to constructing either

a temporary mooring dolphin MD1 away from the works area interface or incorporating MD1 into the design of the permanent structure such that it does not impede operations at the new PCF berth but can also be constructed without impeding existing operations.

Parting mooring lines

Parting mooring lines presents a risk to worker's safety when conducting activities around berthed vessels. Snap-back occurs when a tensioned mooring line breaks, releasing stored energy and causing the line ends to recoil violently towards or past their secured ends. When a synthetic mooring line breaks, the snap-back effect can be extremely powerful, and the rope ends may reach a high velocity as they recoil. Anyone standing within the snap-back zone at either end of the line risks serious injury or death. The design of the new structure will need to consider worker safety during construction or relocating of the proposed jetty extension and conveyor supporting infrastructure sufficiently away from the existing jetty to avoid interaction with mooring lines.

14 Appendix A. Estimate Submission Schedule and Summary

Refer attachment.

Item #	Description	Unit	Quantity	Unit Rate	Amount
1000	PHASE 1 - TRANSHIPMENT FACILITY				
1100	Contractor Preliminaries				
1110	Contractor Recurring Costs for Project Management, Survey, Temporary Facilities, Indirect Costs	Lot	1.0	14,336,433.23	14,336,433.00
1120	Securities and Insurances	Lot	1.0	691,082.84	691,083.00
1130	Project Mobilisation	Lot	1.0	4,052,987.98	4,052,988.00
1140	Project Demobilisation	Lot	1.0	3,987,170.56	3,987,171.00
1200	Rock Works				
1210	Rock Wharf - Procure Quarry Material	Lot	1.0	29,138,814.48	29,138,814.00
1220	Rock Wharf - Logistics & Delivery of Quarry Materials to site by barge	Lot	1.0	26,667,396.38	26,667,396.00
1230	Installation of Rock Wharf core, filter, armour and fabric	Lot	1.0	8,897,021.50	8,897,022.00
1300	Marine Structures				
1310	Transship Berthing Structures	Lot	1.0	4,822,678.46	4,822,678.00
1320	RORO Ramp Facility - allow for construction of Ramp as per Concept Image	Lot	1.0	803,637.59	803,638.00
1400	Product Handling and Loadout				
1410	Shiploader Package - Design, Supply, Delivery & Installation	Lot	1.0	8,101,152.17	8,101,152.00
1420	Feed Conveyor along Rock Wharf (400m long from Transfer Tower to barge loader)	Lot	1.0	4,288,173.74	4,288,174.00
1430	Transfer Tower Phase 1 CV	Lot	1.0	658,174.14	658,174.00
1440	Feed Conveyor Landside of Phase 1 transfer tower	Excluded			
1480	Services reticulation Phase 1 (provision)	Lot	1.0	708,800.89	708,801.00
1490	Gensets and loadbank - excluded (assumed hired and maintained as OPEX cost)	Excluded			
Subtotal - Phase 1 Direct Costs					107,153,524.00
	Indirect/Owner Costs				
6000	Engineering				
6100	Engineering Design and Construction Support	Lot	1.0	3,750,276.23	3,750,276.00
7000	Temporary Facilities				
7100	Temporary Facilities - Construction Camp	Lot	1.0	9,994,491.45	9,994,491.00
7200	Temporary Facilities - Access, Enabling, Haul Roads, Water - Excluded	Excluded			
7300	Charter Flights Package - Brisbane to Site (wkly)	Lot	1.0	2,340,269.81	2,340,270.00
8000	Owner Costs				
8100	Project Management Team	Excluded			
8200	Owners Costs / Approvals	Excluded			
Subtotal - Phase 1 Indirect Costs					16,085,037.00
9000	Contingency				
9100	Contingency Provision (nominally 30% Class 5 AACE Estimate)	Lot	1.0	36,963,059.88	36,963,060.00
9500	Escalation - Excluded	Excluded			
Subtotal - Phase 1 Contingency					36,963,060.00
PHASE 1 - TOTAL PROJECT COST (Q1,2024 Basis)					160,201,621.00

Item #	Description	Unit	Quantity	Unit Rate	Amount
2000	PHASE 2 - JETTY LOADOUT FACILITY (5 Mtpa)				
2100	Contractor Preliminaries				
2110	Contractor Recurring Costs for Project Management, Survey, Temporary Facilities, Indirect Costs	Lot	1.0	22,958,855.59	22,958,856.00
2120	Securities and Insurances	Lot	1.0	2,017,048.29	2,017,048.00
2130	Project Mobilisation	Lot	1.0	13,037,167.44	13,037,167.00
2140	Project Demobilisation	Lot	1.0	6,864,992.70	6,864,993.00
2200	Marine Structures				
2210	Berthing and Mooring Dolphins				
2211	Berthing Dolphins	no.	5.0	3,166,632.23	15,833,161.00
2212	Mooring Dolphin	no.	1.0	3,068,313.88	3,068,314.00
2213	Demolition of Existing Mitsubishi Mooring Dolphin	no.	1.0	555,550.83	555,551.00
2220	Jetty Extension				
2221	Jetty Piling	Lot	1.0	18,026,125.64	18,026,126.00
2222	Jetty Pilecaps	Lot	1.0	2,298,812.40	2,298,812.00
2223	Steel Jetty Deck Structure	Lot	1.0	15,424,911.72	15,424,912.00
2230	Approach Jetty Structure - to support new feed CV and Transfer Tower				
2231	Piled Conveyor Support Structure	Lot	1.0	8,783,166.27	8,783,166.00
2232	Transfer Tower Piled Support Structure	Lot	1.0	4,586,302.08	4,586,302.00
2300	Product Handling and Loadout				
2310	Feed Conveyor - Overland (670m total from Phase 1 Transfer Tower to Jetty Transfer tower)	Lot	1.0	6,178,188.10	6,178,188.00
2320	Feed Conveyor - Marine (in 475m long truss conveyor from Transfer Tower to feed shiploader)	Lot	1.0	9,627,416.10	9,627,416.00
2330	Transfer Towers (in 2 No)	Lot	1.0	2,298,486.21	2,298,486.00
2340	Shiploader - Design, Supply, Delivery & Installation	Lot	1.0	24,487,881.05	24,487,881.00
2400	Services				
2410	Services provision - Electrical, Hydraulic and Cathodic Protection	Lot	1.0	13,148,166.68	13,148,167.00
2420	Services headworks and landside services - excluded	Excluded			
Subtotal - Phase 2 Direct Costs					169,194,546.00
	Indirect/Owner Costs				
6000	Engineering				
6100	Engineering Design and Construction Support	Lot	1.0	5,921,157.31	5,921,157.00
7000	Temporary Facilities				
7100	Temporary Facilities - Phase 2 construction crew accomodated in established mine camp	Lot	1.0	3,966,861.65	3,966,862.00
7200	Landside Facilities - Access, Enabling, Haul Roads, Water - Excluded	Excluded			
7300	Charter Flights Package - Brisbane to Site (wkly)	Lot	1.0	2,628,374.00	2,628,374.00
8000	Owner Costs				
8100	Project Management Team	Excluded			
8200	Owners Costs / Approvals	Excluded			
Subtotal - Phase 2 Indirect Costs					12,516,393.00
9000	Contingency				
9100	Contingency Provision (nominally 30% Class 5 AACE Estimate)	Lot	1.0	54,517,933.69	54,517,934.00
9500	Escalation - Excluded	Excluded			
Subtotal - Phase 2 Contingency					54,517,934.00
PHASE 2 - TOTAL PROJECT COST (Q1,2024 Basis)					236,228,873.00

Appendix G: Cowie Environmental Services Report



Brett Plant
Director
Advisory Partner Connect Pty Ltd
Level 18/324 Queen Street,
Brisbane City Qld 4000

Memo

Prepared by:	Santiago Lam
Cc:	Brendan Cowie
Date:	5 March 2024
Re:	Summary of Diatreme Resources proposed Northern Silica Project - silica sand mine at Cape Flattery

EXECUTIVE SUMMARY

Cowie Environmental Service Pty Ltd were engaged by Metallica Minerals Limited to complete an environmental review of Diatreme Resources Ltd (Diatreme) current projects. Diatreme is an emerging Australian producer of mineral and silica sands with a current project portfolio that includes proposed mineral and silica sands mines within Queensland and Western Australia.

The aim of the assessment was to understand the environmental constraints that the current projects are presented with. This assessment was based on factual publicly available data.

Diatreme's key standalone projects include the Galalar Silica Sand Project at Cape Bedford, the Northern Silica Project (NSP) at Cape Flattery and the Cyclone Zircon Project in Western Australia. Diatreme's main focus at present is the NSP, which has a significant resource of high-purity silica sand with the potential for long-term extraction. The NSP project was classified as a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (ref. EPBC 2023/09485) on June 14, 2023 and on the January 12, 2024, the project was designated as a coordinated project under the *State Development and Works Organisation Act 1971*.

Diatreme's export focus as referred to in their IAS for the NSP is to gain approval to use existing marine infrastructure at Mitsubishi's silica sand mine. Should approval not be granted to use this infrastructure, NSP will have to refocus on other noted options which may result in a redesign and rethink of their project approach. This has the potential to impact their supply distribution methodology and infrastructure, which may present some additional currently unknown environmental approvals constraints.

PURPOSE

This memo has been developed by Cowie Environmental Services Pty Ltd (Cowie) to summarise the status to date of the proposed Diatreme Resources Ltd (Diatreme) silica sand mines in and around Cape Flattery. The memo includes a summary of Diatreme as a company, details on the proposed silica sand mines, where it is in the approvals process and a summary of the full approval pathway. This memo has been prepared using publicly available information on Diatreme and predominantly refers to the proposed silica sand project known as the Northern Silica Project (NSP).

SUMMARY OF DIATREME RESOURCES LIMITED

Diatreme Resources Ltd (ASX:DRX) is an emerging Australian producer of mineral and silica sands based in Brisbane. Diatreme's key standalone projects include the Galalar Silica Sand Project at Cape Bedford (EPM17795) and the NSP which is adjacent to Mitsubishi's Cape Flattery Silica Mine (CFSM) at Cape Flattery. Diatreme also has the Cyclone Zircon Project in Western Australia, which is considered the largest undeveloped high-grade zircon project in the Eucla Basin.

NORTHERN SILICA PROJECT

NSP has an established indicated and inferred resource of 235 million tonnes of high purity silica sand, with potential for further expansion. A Scoping Study released in June 2023 highlighted the potential for a valuable long life mining operation, of significant scale and in close proximity to existing marine infrastructure. The study indicated a potential production rate of 5 million tonnes per annum (Mtpa) could be sustained for 25 years, with potential for further resource expansion.

The project is proposed as a drive-in, drive-out operation creating 120 jobs and training opportunities for the local community. Diatreme's website (<https://diatreme.com.au/northern-silica>) also mentions metallurgy tests have indicated the NSP's ability to produce a high purity, low iron silica product suitable for solar panel manufacturers and other specialty glass makers.

In June 2022, Diatreme announced a transformational strategic partnership with global material solutions leader Sibelco. A leading supplier of silica to the Asian market for specialty glass, Sibelco brings world-class silica processing and technical knowledge along with marketing and development expertise based on its 150 years of international experience.

Sibelco completed in December 2022 its first tranche investment (\$11m) to hold a 9.99% project interest, with a second investment tranche undertaken in October 2023 (\$24m) taking its total project interest to 26.8%, with the balance (73.2%) held by Diatreme.

NSP PROGRESS TO DATE

The Federal Minister for Environment and Water classified NSP as a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (ref. EPBC 2023/09485) on June

14, 2023. Consequently, an Initial Advice Statement (IAS) for NSP was prepared and submitted on November 29, 2023. On January 12, 2024, the project was designated as a coordinated project under the *State Development and Works Organisation Act 1971*. Currently, NSP is awaiting the Terms of Reference (ToR) to be prepared for the Environmental Impact Statement (EIS).

Figure 1 shows the current coordinated projects occurring in the Cape Flattery region. The site consists of different areas designated for Northern Silica mining operations. MLA100308 is where the main mining activities, processing, and stockpile areas occur alongside related infrastructure. There is one dune lake within MLA100308 which is approximately 0.85km² in size. MLA100310 is a planned area for mining infrastructure that will create a pathway for a conveyor linking MLA100308 to the Port of Cape Flattery, crossing an existing mining lease. The Port is located adjacent to ML100313 which is owned by Ports North and operated by Mitsubishi. It is also noted that as of the 4th of March 2024 Diatrene does not have approval to access this port. MLA100313 provides access over land owned by Ports North at the Port of Cape Flattery. MLA100311 and MLA100312 represent proposed mining infrastructure access roads from the Starcke Highway to the site, offering two alternative routes.

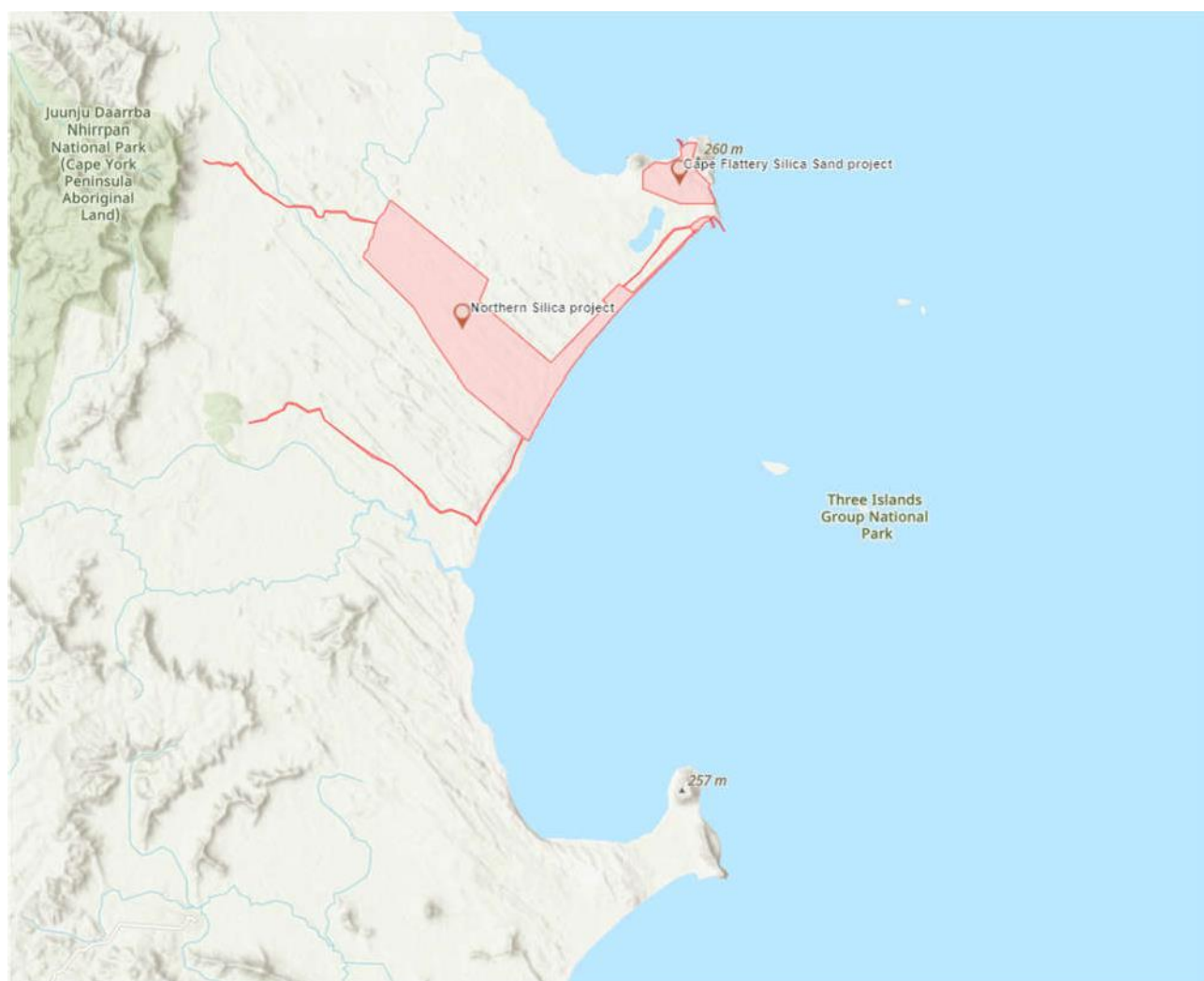


Figure 1: Coordinated Projects Map, Queensland Government (2021)

ADDITIONAL PROJECTS

Since 2019, Diatreme have been involved in the planning and approvals for the Galalar Silica Sand Project (GSSP), located east of the Hope Vale township between Cape Bedford and Nob Point (Figure 2). However, it should be noted that the NSP, following extensive exploration, resource definition and export optionality studies has become Diatreme's priority for development. In accordance with this, the EIS process for the GSSP has currently been withdrawn (including withdrawing of referral EPBC 2020/8626). Whilst the GSSP's established resource remains important to Diatreme, the development timeline for the GSSP will occur after the NSP becomes fully operational.

The Cyclone Zircon Project is located in Western Australia with an estimate of up to 203Mt at 2.3% HM (<https://diatreme.com.au/cyclone>). With a mining lease secured and definitive feasibility studies indicating a profitable venture with a 13.2-year mine life, Diatreme Resources has entered into partnerships with Chinese companies for off-take, investment, and construction services. The project's value is further enhanced by the inclusion of the strategic metal hafnium. On Wednesday, 6 September, 2023 Pursuant to section 45 of the Environmental Protection Act 1986, as applied by section 46(8), it has been agreed that the implementation conditions set out in Ministerial Statement No. 1052, be amended as specified in this Statement. This change included an extension of the conditional approvals for another five years from the date on the Statement (https://www.epa.wa.gov.au/sites/default/files/Ministerial_Statement/Ministerial%20Statement%201210.pdf).

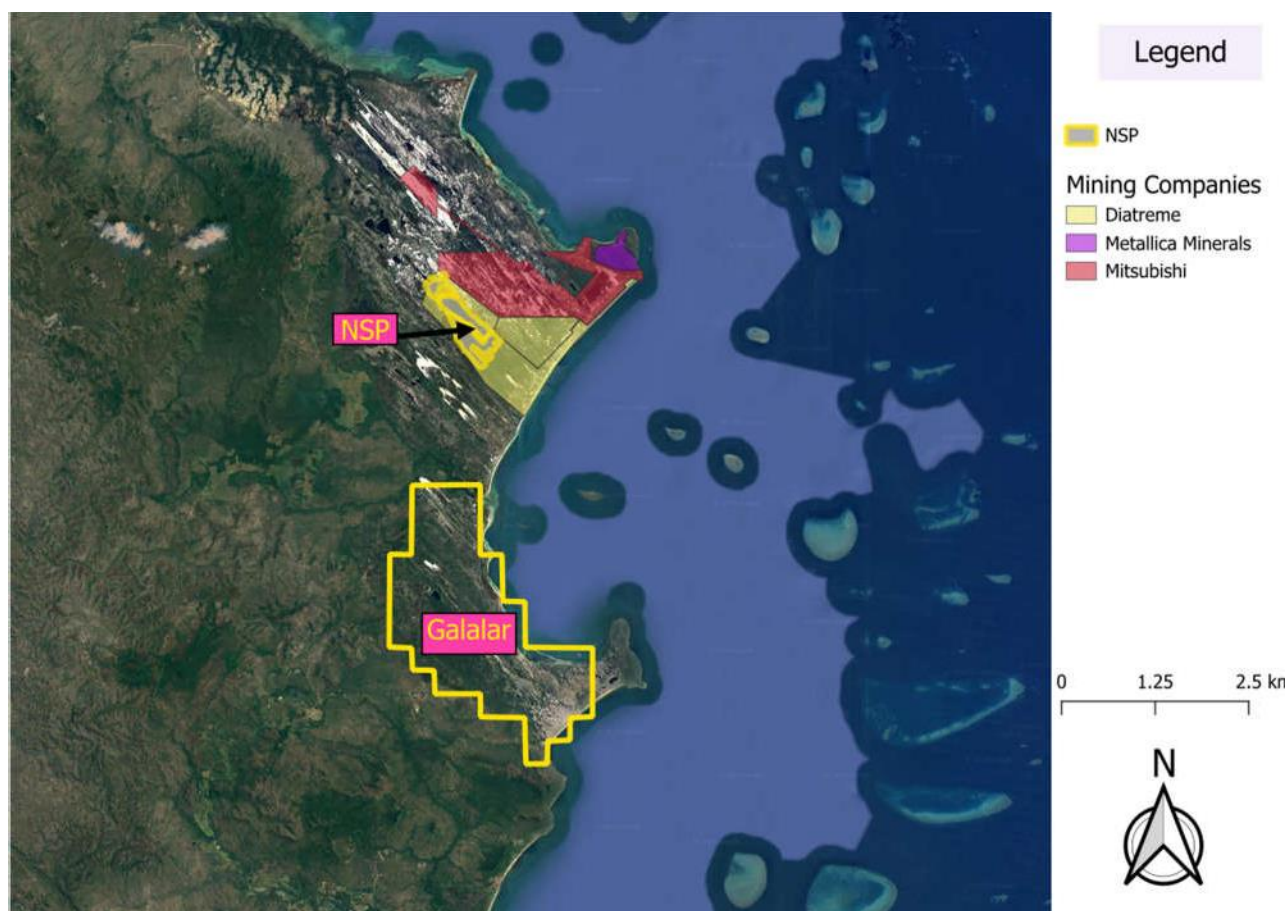


Figure 2: Diatreme projects overview, Cowie (2024)

NSP APPROVAL PATHWAY

Upon declaration as a coordinated project, a draft EIS terms of reference (ToR) will be prepared (which Diatreme expected Q4 2023 or Q1 2024, shown in figure 4) by the Office of the Coordinator General (OCG), this may be followed by a public consultation period for feedback. Once finalised, the proponent prepares a draft EIS (expected Q4 2024), which is then publicly released and evaluated by the OCG. Additional information may be requested during evaluation, and upon revision, the final EIS is released as a formal report if all conditions are satisfied by the OCG (expected Q1 2025 or Q2 2025). Figure 3 displays the full coordinated project process.

Steps in the assessment process

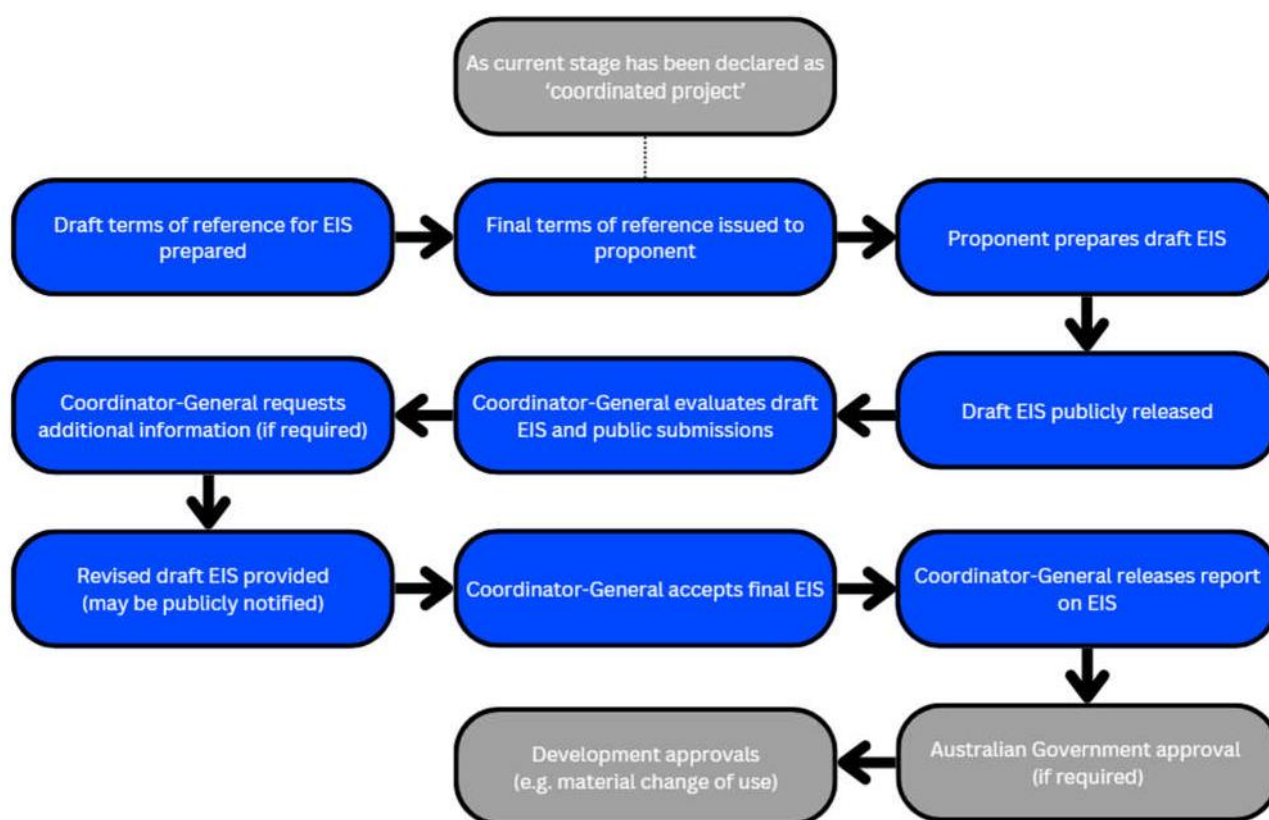


Figure 3: Assessment process, Queensland Government (2021)

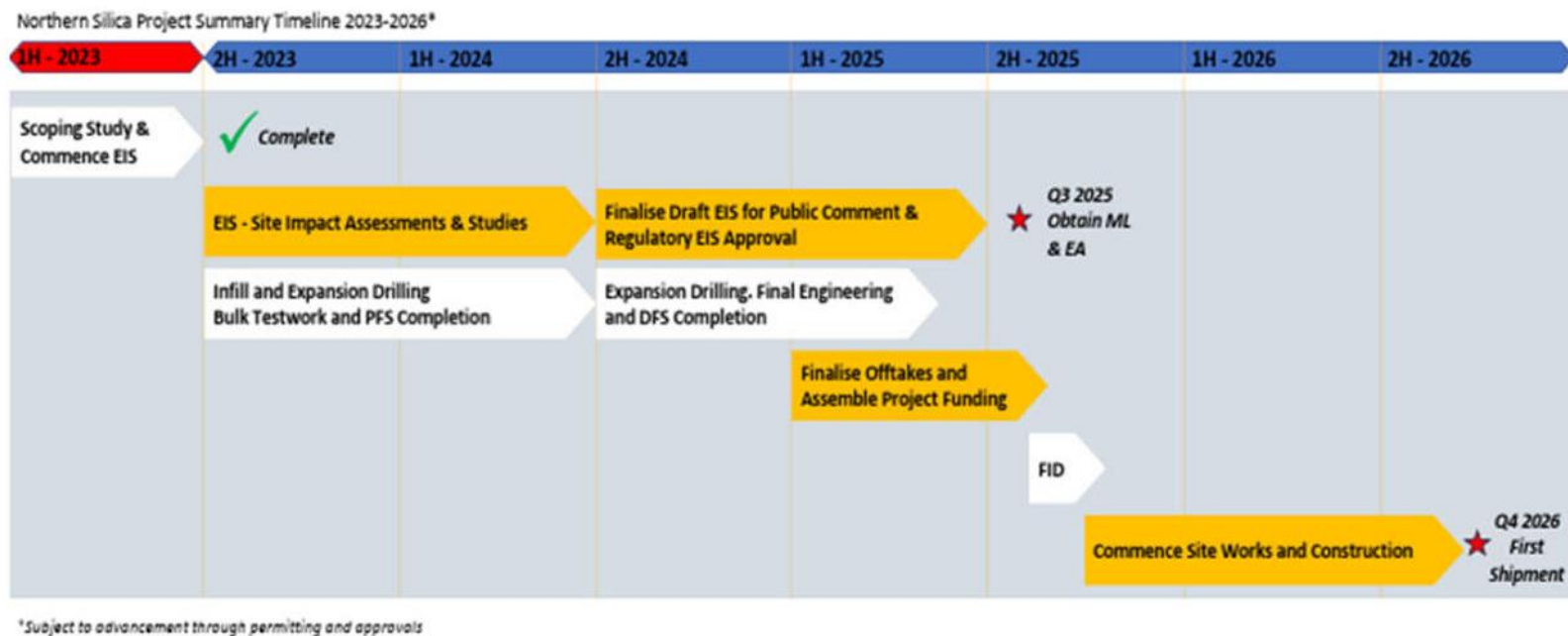


Figure 4: Diatreme expected pathway, BMT (2023)

ADDITIONAL APPROVALS

Due to the complexity of NSP, a series of approvals would be required beside the Coordinator-General's Evaluation Report (CGER), as detailed in Table 1 and Table 2 below:

Table 1: All stated approvals of NSP, BMT (2023)

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
SDPWO Act	Coordinator-General's Evaluation Report	Whole of project	Office of the Coordinator-General	ToR issued for the project	Yes – seeking imposed conditions
ACH Act	CHMPs	One for each Aboriginal Party within the overarching project	Native Title body / Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	CHMP guidelines	No – to be developed in parallel with the EIS
SSRC Act	SIA and SIMP	While of project	Office of the Coordinator-General	SIA and SIMP guidelines	Yes – assessed as part of the EIS
EP Act	Resource EA and EAs for ERA 31, 8 and 63	Mining activities and mining infrastructure, including vegetation clearing	DES	EP Act / EP Regulation requirements / Mining Model Conditions (as applicable)	Yes – seeking stated conditions
EP Act	EA for ERA 50	Export	DES	EP Act / EP Regulation requirements	Yes – seeking stated conditions
EP Act	PRCP	Mining activities	DES	Guideline ESR/2019/4964 Progressive rehabilitation and closure plans	Partial – seeking stated conditions associated with rehabilitation to align with PRCP but recognise actual PRCP approval is granted alongside EA
Water Act	Water licence	Water extraction and use	RDMW	N/A	Yes – seeking stated conditions or recommended stated conditions

Table 2: All stated approvals of NSP, BMT (2023)

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
Planning Act	Development Permit for concurrence ERA	Mining activities, export	State Assessment and Referral Agency	State code 22	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for tidal works	Maritime infrastructure	Ports North / State Assessment and Referral Agency	State code 7 and state code 8 Port of Cape Flattery Land Use Plan and development codes	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for waterway barrier works	Infrastructure crossings of waterways	State Assessment and Referral Agency	State code 18	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for marine plant disturbance (if applicable)	Clearing of marine plants	State Assessment and Referral Agency	State code 11	Yes – seeking stated conditions or recommended stated conditions
NC Act	Protected Plant Permit	Clearing or translocating protected plant species	DES	Protected Plants Assessment Guidelines	No, but to be considered in general recommendations for the CGER
NC Act	Species Management Program	Affecting the breeding habitat of a species	DES	Information sheet: Requirements for tampering with a protected animal breeding place in Queensland	No, but to be considered in general recommendations for the CGER
Environmental Offsets Act	Agreed Delivery Arrangement	Any significant residual impact	DES	Significant Residual Impact Guidelines	Yes – EIS to include a biodiversity offset strategy or equivalent if required

It is also noted that additional assessments may be required as a result of the above listed approvals. Such as the requirement to undertake an assessment against State code 11 for clearing of marine plants.

The Project Area is located within the Cape Flattery Dune Lakes system, which is a listed wetland of national importance on the *Directory of Important Wetlands in Australia (DIWA)* (No. QLD059). Lacustrine and palustrine waterbodies are classified as high ecological significance (HES) wetlands (Figure 5). HES wetlands are mapped across the north-western transport route, throughout the main mining area (MLA100308) and to the north-east. Therefore, the project will require a Development Approval for operational works in a wetland protection area as the NSP will impact the highly ecologically significant wetland under the *Environmental Protection Act 1994 (EP Act 1994)*. Diatremes IAS states there are littoral rainforests on the mine site which are Matters of National Environmental Significance (MNES), however it does not mention the protected wetlands and their regulatory requirements.

NSP would also need development permits, the EA for export operations and environmental management plans which show how you'll avoid and minimise the impacts of a project you've referred under the EPBC Act. These are tertiary approvals as they relate primarily to operationally specific activities that can only be resolved through more detailed design.

NSP has proposed an initial production capacity during Phase 1 of 3.75Mtpa which then will expand to 6.25Mtpa during Phase 2. This surpasses existing operations, potentially straining the capacity of the wharf at Mitsubishi. While discussions are ongoing with Mitsubishi's CFMS for access, access continues to be refused. Access to the wharf may only be able to be secured under Section 316 of the *Mineral Resources Act 1989*, which allows the Minister for Resources to facilitate this access without the consent of the lease holder if, '[it] would optimise the development and use of the State's resources to maximise the benefit for all Queenslanders'. While the Coordinated Project pathway cannot direct an outcome related to a Ministerial-level decision under an Act, it can assist to assess, analyse and demonstrate that the criteria around optimisation of State resources is met should a section 316 access easement be sought for the NSP in future. Additionally, constructing a new rock barge facility within the port's limits is proposed to support construction initially and later facilitate silica product transshipment to ocean-going vessels (OGV). This may trigger additional development permits in the future pathway.



LEGEND

Project Elements

- Camp, CFP Onshore Lease, Infrastructure Corridor CFSM, Process and Infrastructure, Revised NRP MLA, Stockpile 1 & 2
- Si2 Nth Extension Drilling

MSSES

- Si2 Nth Resource
- Port Limits
- Marine Park - Highly Protected Zones
- Reefs and Shoals

Wetlands

- High Ecological Significance Wetlands
- Regulated Vegetation 100m from Wetland
- Selected Mining Leases

Other

- Seagrass

Figure 4 - HES wetlands surrounding NSP

Title: **MSES Wetlands and Coastal Habitats around the Project Area**

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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Figure 5: Wetland on NSP, Cowie (2024)

ENVIRONMENTAL CONSTRAINTS

Land

Soils at NSP consist of primarily Daunt soil units, prone to blowouts, with vegetation consisting of mainly heath and perched lakes common at the site. NSP may contain acid sulphate soils which could acidify and degrade water quality. There is no identified known contamination present on the site. Additionally, the area does not currently engage in active agriculture. National parks in Cape York Peninsula are unaffected by the project (Figure 6).



LEGEND

E2L

Land Boundaries

Project Elements

Camp, CFP Onshore Lease, Process and Infrastructure, Infrastructure Corridor, Revised NRP MLA, Stockpile 1 & 2

Si2 Nth Extension Drilling

Si2 Nth Resource

Figure 6 - NSP in relation to National park

Title:

Local National Parks and Cape York Peninsula Aboriginal Land

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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Water

As there is limited water supply available from other allocation holders and sources, this water allocation will be subject to an approval process under the *Water Act 2000* and *Water Plan (Cape York) 2019* to allow for access to the strategic reserve. The total volume of water sought from the reserve is 3,500ML/yr for the life of the mine. While the limit for a water license from the Strategic Reserve is 25, 000ML, the proposed water licence is therefore within the water license limit. However, the NSP's IAS only mentions 3186ML/yr without clarifying the additional 400ML (Figure 7).

Usage	Description	Water loss	ML/year
Processing water usage			
Product water loss	5Mtpa product to stockpile	15% water drains to ground	882
Reject sand water loss	1.33Mtpa reject sand to mine rehabilitation	40% water drains to ground	887
Fine rejects water loss	0.34Mtpa fine reject to mine rehabilitation	80% water drains to ground	1,360
Evaporation	10ha wet area	2m evaporation	20
Processing sub-total			3,149
Facilities and services water usage			
Accommodation camp and amenities	100-person camp, offices, work facilities	100 people x 300L/day	11
Road maintenance	Maintenance and dust control	20kL trucks, 2 per day	15
Workshops and equipment maintenance	Cleaning vehicles, machinery, equipment	30m ³ per day	11
Facilities and services sub-total			37
Total site water usage			3,186

Figure 7: NSP water consumption, BMT (2023)

Mining processes include groundwater extraction and reinjection. The operation also involves direct discharge of contaminants from mining operations to waterways or water bodies other than re-injection of clean water back to the groundwater aquifer. The mining footprint should avoid and be buffered from wetlands, waterbodies and waterways on the mining lease area and demonstrate 'no change' to groundwater and surface water quality offsite.

Diatreme has commenced water quality monitoring for the site, this remains in a preliminary stage, it is not clear how Diatreme propose to achieve 2 years of water quality data prior to their EIS process which Diatreme expects to finish in 2024.

There is currently no evidence to suggest that diversion of surface water or other surface waterbodies will occur as part of the project. With GIS investigation of NSP, it appears that the site intersects a number of waterways under the *Fisheries Act 1994* and potential watercourses under the *Water Act 2000* (Figure 8). If this is the case the proposed mine activities will trigger additional approvals not already identified. Confirmation is required from both the Department of Agriculture and Fisheries and Department of Regional Development, Manufacturing and Water as to the waterway and watercourse determination of the water features on site.



Figure 8: NSP's area impacting Fisheries Act waterways, Cowie (2024)

Flora and fauna

NSP is part of a coastal dune system, it hosts a diverse range of vegetation communities and habitats supporting various flora and fauna typical of littoral environments. High ecologically significant wetlands are present within the proposed mine footprint. No reefs or shoals that are directly adjacent to the area are impacted based on the current project. The NSP IAS includes reference to requiring further investigations for rocky shores, sparse macroalgae and coral species in the broader marine study area to inform the EIS.

With GIS investigation, areas impacted by Matters of State Environmental Significance (MSES) are shown in figure 9. The MSES contains local endanger species or protected vegetation.



Figure 9: NSP area impacted by MSES, Cowie (2024)

Costal environment

NSP overlaps with coastal management districts as shown in figure 10. If mining operations occur within these areas, there is potential for the mine footprint to enter the tidal area and highest astronomical tide zone. NSP also involves the construction of new infrastructure in the coastal zone (e.g. conveyor, new maritime infrastructure), and may impact on the foredune and marine habitats which supports shorebirds and marine turtles. The controlled action includes the potential for turtles to be present on the beach where the conveyor or slurry pipeline will be.



Figure 10: NSP overlap with CMD, Cowie (2024)

Flooding and regulated structure

NSP is not designated as a flood zone under Hope Vale Aboriginal Shire Council local planning schemes. No regulated structures like dams or levees are planned for the project area. Therefore, there is a risk of flooding to the site and access road which could lead to restricted movement during the wet season.

Air quality

Minimal industrial emissions are expected from NSP, with no local air quality monitoring available. Anticipated emissions include dust and plant emissions from mining and port activities.

Noise and vibration

Noise sources in the NSP are anticipated to be minimal, primarily from mining activities and Port of Cape Flattery operations. Sensitive receptors, such as the Australian Kite Surfari hotel, are located over 20 km away, therefore any noise impact on important amenity is anticipated to be minimal.

Community

Diatreme intend to employ a local workforce, focusing on housing and community wellbeing in the townships of Hope Vale and Cooktown. Any employees living in the wider community will be accommodated in Hope Vale and Cooktown during construction and transported to site via bus.

Traditional land ownership (TLO)

NSP is undertaking close consultation with the local Registered Native Title Body Corporates (RNTBCs) and Traditional Owners in the area to identify and avoid areas of cultural heritage significance. Mining Project Agreements (MPAs) will be established with Traditional Owner representative organizations to confirm equity sharing arrangements and employment opportunities. Negotiations for these agreements are ongoing and expected to conclude by the end of 2023. However, there is no indication of any completed agreements at the time of this memo.

All quantifiable constraints

Upon GIS analysis of all relevant constraints, the analysis indicates that the above detailed constraints would impact a total area of 282.8113 hectares as shown in Figure 11.

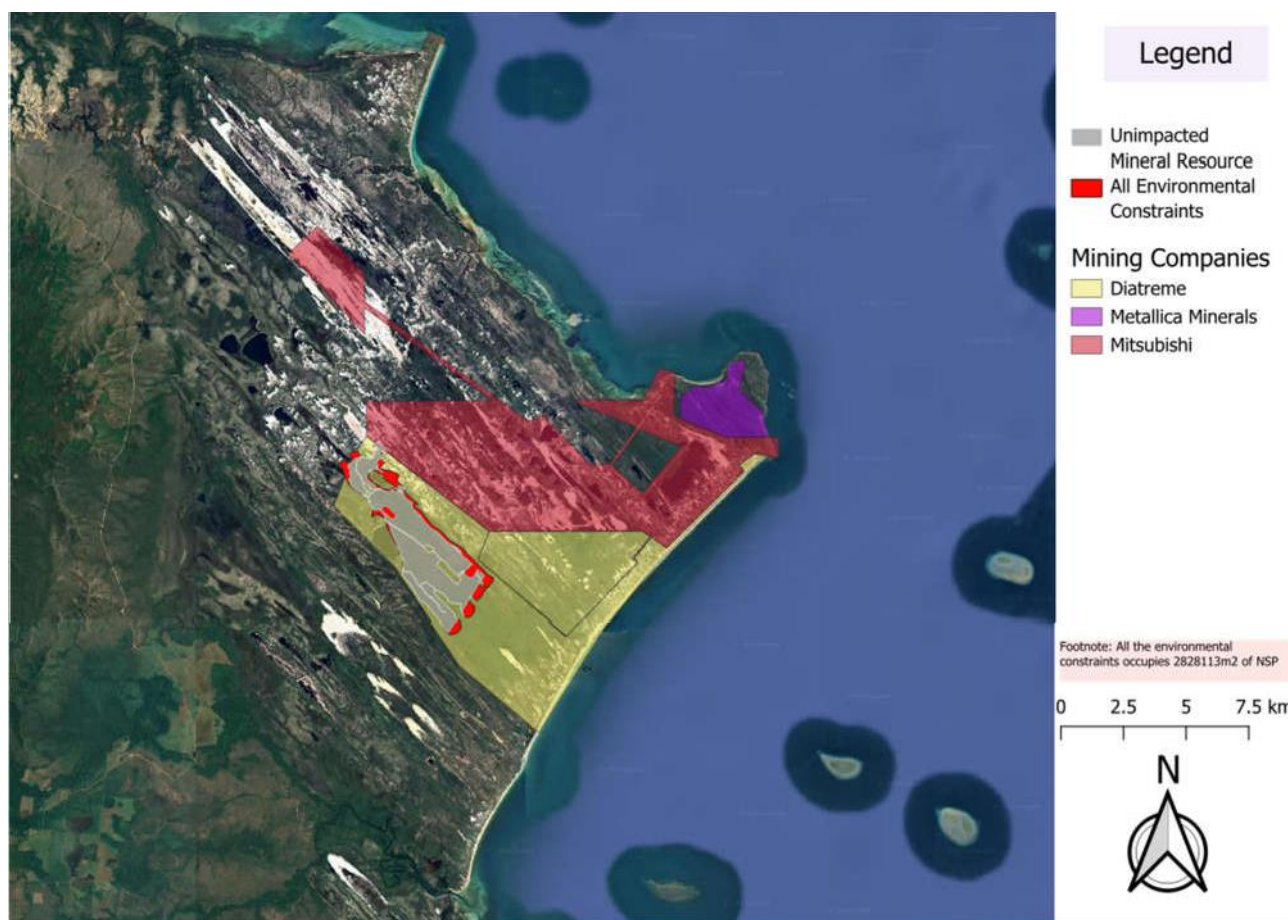


Figure 11: All relevant impactful constraints on NSP, Cowie (2024)

SUMMARY

A series of approvals will be required for the NSP, including the Coordinator-General's Evaluation Report (CGER) under the SDPWO Act and Controlled Activity Approval under the EPBC Act. Furthermore, there will be a need to apply for and be granted additional environmental approvals that may not yet be identified in the NSP IAS. Any additional environmental approvals may result in future restrictions or amendments to the design/layout and scale required.

Diatreme's export focus as referred to in their IAS for the NSP is to gain approval to use existing marine infrastructure at Mitsubishi's silica sand mine. Should third party approval not be granted to use this infrastructure, NSP will have to refocus on other noted options which may result in a redesign and rethink of their project approach. This has the potential to impact their supply distribution methodology and infrastructure, which may present some additional currently unknown approvals constraints.

Yours sincerely,



Brendan Cowie

Principal Environmental Scientist and Managing Director
Cowie Environmental Services Pty Ltd

REFERENCE LIST

1. Australian Government, Department of Climate Change, Energy, the Environment and Water. (2023) Action management plans for projects referred under the EPBC Act. Reviewed from: <https://www.dcceew.gov.au/environment/epbc/advice/action-management-plans>
2. BMT. (2023) Coordinated Project Application Initial Advice Statement. Reviewed from: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0022/86611/northern-silica-project-ias.PDF
3. Diatreme Resources. (n.d) Introduction of Northern Silica Project. Reviewed from: <https://diatreme.com.au/northern-silica>
4. Diatreme Resources. (n.d) Introduction of Cyclone Zircon Project. Reviewed from: <https://diatreme.com.au/cyclone>
5. Environmental Protection Authority. (2023) STATEMENT TO AMEND THE IMPLEMENTATION CONDITIONS APPLYING TO A PROPOSAL. Reviewed from: <https://www.epa.wa.gov.au/sites/default/files/1MINSTAT/Ministerial%20Statement%201210.pdf>
6. Queensland Government. (2021) The Coordinated Project process. Reviewed from: <https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/the-coordinated-project-process>

Annexure 3 – Revised Independent Expert's Report (Marked-up)



Metallica Minerals
Independent Expert's Report
~~24 April~~ 21 May 2024

Financial Services Guide

About us

Advisory Partner Connect Pty Ltd ("**Advisory Partner**") a Corporate Authorised Representative of AP Lloyds Pty Ltd ACN 643 090 359 Australian Financial Services Licence ("**AFSL**") 526061 has been engaged by Metallica Minerals Limited (ASX:MLM) ("**Metallica**") or ("**the Company**") to provide financial product advice in the form of an independent expert report ("**the Report**") to express our opinion whether the offer is fair and reasonable ("**Offer**"). Our Report sets out our opinion as to the Fair Market Value of the shares in Metallica. The Corporations Act 2001 (Cth) requires us to provide this Financial Services Guide ("**FSG**") in connection with the attached Report prepared for Metallica. You are not the party who engaged us to prepare this Report and we are not acting for any person other than Metallica. This FSG provides important information designed to assist Shareholders in forming their views of the Offer and in understanding any general financial advice provided by Advisory Partner in this Report. Our Report is not intended to comprise personal retail financial product advice to retail investors or market-related advice to retail investors. This FSG contains information about our engagement by the directors of Metallica to prepare this Report in connection with the Offer, the financial services we are authorised to provide, the remuneration we (and any other relevant parties) may receive in connection with the Engagement, and details of our internal and external dispute resolution systems and how these may be accessed.

Financial services we are authorised to provide

Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd, the holder of Australian Financial Services Licence number 526061, is responsible to you for the services provided under this FSG. As a Corporate Authorised Representative the Australian Financial Services Licence authorises us to provide the following services to both retail and wholesale clients, financial product advice in relation to securities, fixed income and derivatives.

General financial product advice

This Report contains only general financial product advice. It was prepared without taking into account your personal objectives, financial situation or needs. Where the advice relates to the application for or acquisition of a financial product, you should also obtain and read carefully the relevant offer document or explanatory memorandum provided by the issuer or seller of the financial product before making a decision regarding the application for or acquisition of the financial product.

Remuneration, commissions and other benefits

Advisory Partner charges fees for its services and will receive a fee of \$55,000 to \$65,000 (excluding GST) for its work on this Report. These fees have been agreed on, and will be paid solely by Metallica, which has engaged our services for the purpose of providing this Report. Advisory Partner may seek reimbursement of any out-of-pocket expenses incurred in providing these services. Our advisers are directors and employees of Advisory Partner who are paid salaries and dividends by Advisory Partner and may also receive bonuses and other benefits from Advisory Partner. Our advisers may alternatively be paid by means of commission determined by a percentage of revenue written by the adviser.

Associations and relationships

Other than as set out in this FSG or this Report, Advisory Partner has no association or relationship with any person who might reasonably be expected to be capable of influencing them in providing advice under the Engagement. Advisory Partner, its officers and employees and other related parties have not and will not receive, whether directly or indirectly, any commission, fees, or benefits, except for the fees to be paid to Advisory Partner for services rendered in producing this Report. Advisory Partner, its directors and employees do not have an interest in securities, directly or indirectly, which are the subject of this Report. Advisory Partner may perform paid services in the ordinary course of business for entities, which are the subject of this Report.

Risks associated with our advice

This Advisory Partner advice is provided in connection with the attached Report relating to the Offer. The Report comprises general product advice and does not comprise personal retail financial product advice to retail investors or market-related advice to retail investors. The Report is an expression of Advisory Partner's opinion as to whether the Offer is fair and reasonable. However, Advisory Partner's opinion should not be construed as a recommendation as to whether or not to approve the Proposed Transaction. Approval or rejection of the Offer is a matter for individual Shareholders based on their own circumstances, including risk profile, liquidity preference, investment strategy, portfolio structure, and tax position. Shareholders who are in any doubt as to the action they should take in relation to the Offer should consult their own independent professional advisers. Further information on the risks, assumptions and qualifications associated with the advice is contained within the Report.

Compensation arrangements

The law requires Advisory Partner to have arrangements in place to compensate certain persons for loss or damage they suffer from certain breaches of the Corporations Act by Advisory Partner or its representatives. Advisory Partner has internal compensation arrangements as well as professional indemnity insurance that satisfy these requirements.

Complaints

Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd, they are required to have an internal complaints-handling mechanism. All complaints can be addressed to us at Level 18, 324 Queen St, Brisbane QLD 4000. You may contact us on T +61 7 3106 3399 or F +61 7 3054 0438, E: admin@advisorypartner.com.au. If AP Lloyds Pty Ltd are not able to resolve your complaint to your satisfaction within 30 days of first lodging it with them, you are entitled to have your matter referred to the Australian Financial Complaints Authority (AFCA). You will not be charged for using the AFCA service. To contact the AFCA: Tel: 1800 931 678 or make a complaint at <https://www.afca.org.au/make-a-complaint>.

Privacy & use of information

We do not collect personal information on individual clients and are bound by the Advisory Partner Privacy Policy in the way that it governs personal information collected on clients. If you have any questions on privacy, please see our privacy policy on our website.

24 April

21 May 2024-

The Directors
Metallica Minerals
Limited Level 1, North
Tower
527 Gregory Terrace
Fortitude Valley QLD
4006

Dear Sirs

INDEPENDENT EXPERT'S REPORT – OFFER TO PURCHASE OF METALLICA MINERALS LIMITED BY
DIATREME RESOURCES

Introduction

The directors of Metallica Minerals (ASX: MLM) ("**Metallica**" or the "**Company**") have requested Advisory Partner Connect Pty Ltd ("**Advisory Partner**") to prepare an Independent Expert Report ("**IER**") to the unrelated shareholders of MLM (the "**Shareholders**"), setting out our opinion as to whether the offer by Diatreme Resources (ASX:DRX) ("**Diatreme**"), is fair and reasonable.

The offer is to purchase shares in Metallica funded via Diatreme shares, Metallica shareholders will receive 1.3319 fully paid ordinary shares in Diatreme for every one (1) ordinary share in Metallica on the record date (the "**Offer**" or "**Transaction**").

There is a minimum acceptance condition of 50.1%.

Metallica has engaged Advisory Partner to provide an Independent Expert Report (the "**Report**" or "**IER**"), which will be provided to the Shareholders, to assist the Directors of Metallica in providing the Shareholders with sufficient information to make their decision as to whether to accept the offer or not.

Summary Opinion

In our opinion, the Offer is not fair and not reasonable for the Shareholders of Metallica.

Fairness

In forming our opinion as to the fairness of the Offer, we have valued each component of the proposal being the fair market value of a Metallica share relative to the scrip offer provided by Diatreme.

Table 1: Fair Value

Fair Value	Unit	Deleted Cells	
		Low Value	High Value
Fair Value of Metallica share on a controlling basis	\$	0.223071	0.278076
Fair Value of combined entity post-transaction (minority basis)	\$	0.061047	0.076056
Premium / (Discount)		-34%	-7325%

Source: AP Analysis
Source: AP Analysis

Advisory Partner assessed the fair market value of Metallica shares, on a control basis, is between \$0.223071 and \$0.278076 per share. By comparison, the assessed value of the combined entity on a minority basis is \$0.061047 to \$0.076056 per share. As demonstrated above, the value of the combined entity per share is lower than the assessed value of a Metallica share and as a result, the Offer is considered not fair for Metallica Shareholders.

We note that we have valued the MLM shares on a controlling basis, which allows for a 30% control premium, and the Offer represents a discount to below the assessed value of more than 70%.

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We cannot predict the trading price of Metallica Minerals in the future, we have allowed for dilution to Metallica Shareholders to raise capital to fund the CFSS project. We cannot predict the trading price of Metallica Minerals and it is likely as the company reaches milestones developing the CFSS Project the share price will increase. As such, we have applied a 70% dilution to the value of CFSS to account for potential future dilutionary effects to fund the project. While the project has reached a Definitive Feasibility Stage there are company specific risks that exist. We consider that calculating a dilution at the current market price allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.

Reasonableness

We deem the offer to be not reasonable to shareholders of Metallica as we consider the disadvantages to outweigh the advantages of the offer. To assist the Shareholders in their decision-making process we have summarized the following:

- The likely advantages and disadvantages associated with the Offer; and
- Alternatives, including the position of Shareholders if the Offer does not proceed.

Shareholders of Metallica should read the full Report, where matters relevant to shareholders are explained in more detail.

Advantages of Approving the Offer

Set out below is a summary of the key advantages to the Shareholders of accepting the Offer.

- **Liquidity of shares**
Metallica shareholders currently face illiquidity in the trading of their shares. On a typical trading day, Metallica shares are thinly traded and have a wide bid-ask spread. As a result, it is difficult to sell shares in Metallica. The transaction may improve liquidity in the shares of the combined entity by increasing the market capitalisation and outstanding share count.
- **Economies of Scale**
The combined entity may provide operational improvements for the mines as both companies hold an interest in mines within the same vicinity.

Disadvantages

- **Dilution of Shares**
As both companies have projects which are pre-development, shareholders are at risk of future capital raisings which may dilute minority shareholders. The non-associated shareholders (excludes common shareholders) of Metallica Minerals and Diatreme Resources account for 49.87% of total shares in Metallica Minerals. This takeover offer sees that decrease to 12.73% of total shares in Diatreme. Diatreme's projects hold 513 Mt of resources, while Metallica holds 47 Mt of reserves at their CFS project according to the feasibility study. As such, Diatreme will require substantial efforts to acquire funding for the projects relative to Metallica, which are likely to be through the issuance of new ordinary shares.
- **Diatreme Funding Risk and Dilution**
[If Diatreme successfully acquires Metallica Minerals, the company will be required to raise capital to fund the CFSS Project. This will further dilute the non-common Metallica shareholders who will already represent a minority interest in Diatreme \(as stated in the above dot point\). Our valuation of Metallica accounts for the dilution discount applied to the CFSS Project as outlined in Section 6.5 and Appendix G. The post-transaction valuation accounts for the dilutive discount of CFSS and the dilutive impact of the consideration. As set out in the post-transaction valuation, the value of the entity, including Diatreme, does not outweigh the value of Metallica.](#)
- **Voting Power**
Diatreme has 3.7bn shares outstanding pre-transaction and will issue 1.278bn shares to Metallica shareholders for the transaction. As such, [non-associated](#) Metallica shareholders will represent [42.7325.6%](#) of total shares post-transaction which is a minor representation in voting power relative to their prior 100% voting power in Metallica Minerals Limited.
- **Project Risk**
Diatreme's Northern Silica projects are at scoping study stage. This early stage of development has not been proven to be economically viable by an independent technical expert and may face unforeseeable factors in order to develop the project in terms of operational costs, environmental requirements, capital expenditures, and other variables which may impact the value of the mine.-

By accepting the offer, Metallica shareholders will be exposed to these risks which may determine whether or not these mines are viable and whether they can be funded.

Other Considerations

- **Common Shareholders**

Metallica and Diatreme have common shareholders. Ilwella Pty. Ltd (“Ilwella”) and SCR-Sibelco N.V. (N.V.) are the top two shareholders of both Diatreme and Metallica Minerals. Sibelco publicly backed the takeover offer from Diatreme. Furthermore, Delphi Unternehmensberatung AG (Delphi AG) controls Sparta AG. In particular, Delphi AG owns 100% of VVBeteiligungen AG, a majority shareholder of Deutsche Balaton AG which has a majority ownership of Sparta AG. With Metallica’s top three shareholders being Ilwella, Sibelco and Sparta AG this takeover suggests limited dilution for major shareholders who continue to retain a significant ownership of Diatreme post-takeover of Metallica.

- **Mitsubishi (CFSM) Sublease**

Diatreme is required to build significant port infrastructure near CFSM’s operations and wishes to utilise the existing wharf. The Sublease between Far North Queensland Ports Corporation Ltd and Cape Flattery Silica Mines Pty Ltd (CFSM) gives CFSM certain rights that may make this difficult both during operations and construction. However, PAEMAC’s report states that the construction of Diatreme’s port infrastructure will cause unavoidable disturbances to Mitsubishi’s operations. As such, it gives CFSM reasons to not allow Diatreme to access the existing infrastructure or proceed with the planned construction activities. This would impact Diatreme’s ability to export.

Shareholder circumstances

Advisory Partner has not considered the effect of the Offer on the particular circumstances of individual Shareholders. Some individual Shareholders may place a different emphasis on various aspects of Proposed Transaction from that adopted in this Report. Accordingly, individuals may reach different conclusions as to whether or not the Offer is in their individual best interests. The decision of an individual Shareholder in relation to the Offer may be influenced by their particular circumstances (including their taxation position) and accordingly, Shareholders are advised to seek their own independent advice.

Other matters

This Report has been requested by the Metallica Directors to assist the Shareholders in their decision to accept or reject the Proposed Transaction.

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Advisory Partner acknowledges that this Report may be lodged by the Directors with the ASX.

Conclusion

Based on the above, we have concluded that the Offer is “not fair” as the offer amount is below the fair value of a Metallica share. Additionally, we have considered the transaction as “not reasonable” because the disadvantages outweigh the advantages.

This opinion should be read in conjunction with the full text of this report which sets out our findings.

Yours faithfully



Brett Plant

Director

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1.0 Glossary of Terms

Table 2: Glossary of Terms

Term	Meaning
Advisory Partner or we or AP or our	Advisory Partner Connect Pty Ltd
ASIC	Australian Securities and Investment Commission
ASX	Australian Securities Exchange
Bid-Ask Spread	A bid-ask spread is the amount by which the ask price exceeds the bid price for an asset in the market.
Control Premium	An allowance made for the premium for control given the strategic benefit that a controlling interest would provide
Corporations Act	Corporations Act 2001
Diatreme or DRX	Diatreme Resources Limited (ASX:DRX)
Dilution	Dilution refers to the reduction in the percentage of existing shareholders' ownership in a company when it issues new shares of stock.
EBITDA	Earnings before Interest, Tax, Depreciation and Amortisation
EBITDA Multiple	The ratio Enterprise Value: Earnings Before Interest Tax Depreciation and Amortisation
Engagement	Our engagement by the Directors of Metallica to prepare this Report in connection with the Offer.
Enterprise Value (EV)	The total value of the business and is equal to Debt + Equity
FOS	Financial Ombudsman Service
Free Float	The shares of a company that can be publicly traded and are not restricted (i.e., held by insiders).
FSG	Financial Services Guide
Future Maintainable Earnings Method	The capitalisation of estimated future maintainable earnings by an appropriate multiple.
FY	Financial Year
HY	Half Year
JORC Code	Joint Ore Reserves Committee (JORC) is a classification system for the public reporting of exploration results, mineral resources and ore reserves.
Liquidity	The ease in which an asset or security can be converted into ready cash without affecting its market price.
LTM	Last Twelve Months
Net Debt	Current Portion of Debt + Non-Current Portion of Debt - Cash and Cash-Equivalents
NACE Code	Nomenclature of Economic Activities (NACE) is the European statistical classification of economic activities
NAICS Code	North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments
NPV	Net Present Value
NRV	Net Realisable Value
Report	This independent expert's report
RG 111	Regulatory Guide 111 - Content of Expert Reports
Statistical Outlier	An extremely high or extremely low data point relative to the nearest data point and the rest of the neighbouring co-existing values in a dataset.
Surplus Assets	Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company.

Source: AP Analysis

2.0 Outline of the Offer

2.1 Introduction and Background

Metallica Minerals Limited (ASX:MLM) ("**MLM or Metallica**") is a resource development company with interests in Silica sand and Copper Gold projects in Queensland. Metallica has a proposed Silica Sand mine located in the Cape Flattery Region of Far North Queensland, adjacent to Mitsubishi's Cape Flattery Silica Sand Mines (CFSM). Another mining exploration company, Diatreme Resources Limited (ASX:DRX) ("**DRX or Diatreme**") is an emerging producer of mineral and silica sands. This company also has a proposed project in the same region as Metallica's Silica Sand Project.

Diatreme announced a takeover intention of Metallica on the 16th of February 2024 for all ordinary shares in MLM. Diatreme released a bidder statement on the 28th of March detailing the conditions to the offer. The offer will see Metallica shareholders receive 1.3319 fully paid ordinary shares in Diatreme for every (1) ordinary share in Metallica held by shareholders at the offer date.

Diatreme's bid highlights a premium of 22.08% based on the closing price of both companies on the 15th of February 2024, where DRX's closing price was \$0.022 and MLM's closing price was \$0.024. Along with this, Diatreme has several conditions of the Offer, which include a 50.1% minimum acceptance condition along with Diatreme's shareholders approving the acquisition of Metallica for the purposes of ASX Listing Rule 10.1.

2.2 Key steps and Conditions of the Offer

The Offer has the following elements:

- Metallica shareholders will be offered 1.3319 ordinary shares in Diatreme for each (1) ordinary share in Metallica.
- Diatreme Shareholder Approval Condition:
 - the approval of Diatreme Shareholders for the purpose of Listing Rule 10.1 for the acquisition of the Metallica Shares held by Ilwella and Sibelco (and issue of the Offer Consideration for each Metallica Share held by Ilwella and Sibelco, to Ilwella and Sibelco as consideration under the Offer) (**Listing Rule 10.1 Approval**)
 - a waiver from ASX to permit the acquisition by Diatreme of the Metallica Shares held by Ilwella Pty Ltd and Sibelco Asia Pacific Pty Ltd (and issue of the Offer Consideration for each Metallica Share held by Ilwella and Sibelco, to Ilwella and Sibelco as consideration under the Offer) without first obtaining the Listing Rule 10.1 Approval; or
 - a notice or confirmation from ASX that Diatreme is not required to obtain the Listing Rule 10.1 Approval,
- The Shareholders need to decide at or before the end of the Offer Period whether to accept the offer or not;
- Diatreme will include as a defeating condition to the proposed takeover bid, a condition that Diatreme obtains either the written consent or waiver from Metallica to the acquisition of Metallica Shares under the proposed takeover bid or the Takeovers Panel makes orders and declarations that Diatreme is no longer restrained from acquiring Metallica Shares under the Offer by the terms of the Confidentiality Deed; and
- There is a minimum acceptance condition of 50.1%.

2.3 Outcome of the Proposed Transaction

Should shareholders of Metallica accept the Offer, the company will no longer trade on the ASX and be owned by Diatreme.

The outcome of the proposed transaction would see Metallica Shareholders be diluted, from majority ownership from the outstanding shares in Metallica, to a minority stake of 25% in Diatreme.

Table 3: Ownership Structure of Proposed Transaction

Company	DRX Issued Shares (Post-takeover)	Percentage of Ordinary Capital Post Takeover
Current Shareholders of Diatreme Resources (including Outstanding Options)	3,796,425,793 729,759,126	74.81 73.84%
Current Shareholders of Metallica Minerals (including Outstanding Options)	1,278,522,672 321,143,472	25.19 26.16%
Enlarged Company	5,074,948,465 902,598	100.00%

Source: AP Analysis

At present, Ilwella Pty. Ltd., SCR-Sibelco N.V. and Delphi Unternehmensberatung AG are common shareholders of both companies.

The Non-associated shareholders initially held 49.9% of Metallica Minerals, while the top three common shareholders, Ilwella, Sibelco and Sparta AG/ Delphi AG owned 50.1%. However, after the takeover, the Non-associated shareholders are diluted to 12.73% while the ownership of the top two shareholders remain at 41%.

The table below shows the top 10 shareholders if the Proposed transaction is successful.

Table 4: Top 10 shareholders of Proposed transaction

Post Takeover DRX Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital
Ilwella Pty. Ltd.	1,092,947,033	21.8264%
SCR-Sibelco N.V. Asia Pacific Pty Ltd	924,186,994 959,577,300	18.45 19.00%
DELPHI Unternehmensberatung AG Aktiengesellschaft / Sparta-AG	333,468,889 343,461,377	6.66 80%
Yufeng Zhuang	151,841,819	3.0301%
Zinvest AG	130,434,783	2.6058%
Chenfei Zhuang	91,700,900	1.8382%
Wu Jie Wu	87,171,308	1.7473%
VW Pty. Ltd.	65,500,001	1.31
Chenxia Zhou	62,500,000	1.2524%
VW Pty Ltd	61,000,001	1.21
Andrew Tsang Lai You	53,177,747	1.0605%
Top 10 Post Takeover Shareholders	2,939,750,827 980,833,621	58.70 59.02%
Other Shareholders	2,070,068,530,974,976	41.3040,98%
Total Issued Shares	5,009,819,358 050,902,598	100.00%
Outstanding Options & Performance Rights	66,666,667	
Total Diluted Shares	5,074,948,465	

Source: AP Analysis

3.0 Purpose, Scope, and Basis of Assessment

3.1 Legislative requirements

Section 640 of the Corporations Law requires an expert opinion to be provided where the bidder is connected with the target company.

Section 640 provides that if:

- (a) the bidder's voting power in the target is 30% or more; or
- (b) for a bidder who is, or includes, an individual — the bidder is a director of the target; or
- (c) for a bidder who is, or includes, a body corporate — a director of the bidder is a director of target.

A target statement given in accordance with subsection 638 must include, or be accompanied by, a report by an expert that states whether, in the expert's opinion, the takeover offer is fair and reasonable and gives the reasons for forming that opinion.'

3.2 Purpose of the report

Advisory Partner has been appointed by the Directors to prepare this report to satisfy the requirement for the preparation of an IER as described above. This report is intended to accompany the target statement to be provided by the Directors to the Shareholders entitled to vote on the Offer ("**Target Statement**").

This report accompanies the Target Statement, required to be provided to the Shareholders, and has been prepared to assist the Directors in fulfilling their obligation to provide shareholders with full and proper disclosure to enable them to assess the merit of the Offer.

This report should not be used for any other purpose, and we do not accept any responsibility for its use outside this purpose. Except in accordance with the stated purpose, no extract, quote or copy of our report, in whole or in part, should be reproduced without our written consent, as to the form and context in which it may appear.

For the purposes of our opinion, the term "fair market value" is defined as the price that would be negotiated in an open and unrestricted market between a knowledgeable, willing, but not anxious purchaser, and a knowledgeable, willing, but not anxious vendor, acting at arm's length.

3.3 Scope

The scope of the procedures we have undertaken in forming our opinion on whether the Offer is fair and reasonable for Shareholders is limited to those procedures we believe are required in order to form our opinion. Our procedures, in the preparation of the report, have not included verification work nor constitute an audit or assurance engagement in accordance with Australian Auditing and Assurance Standards issued by the Australian Auditing and Assurance Standards Board ("**AUS**") or its predecessors. Accordingly, Advisory Partner does not warrant that its inquiries have identified or verified all of the matters which an audit, extensive examination or "due diligence" investigation might disclose.

In preparing this report, we have relied on information provided by various officers of Metallica. We have not undertaken any verification of the financial or other information provided by those officers, or other parties, as set out in this report. Advisory Partner believes the information provided to be reliable, complete and not misleading and has no reason to believe that any material facts have been withheld. The information provided was evaluated through analysis, inquiry and review for the purpose of forming our opinion. Where Advisory Partner has relied on the views and judgement of management the information was also evaluated through analysis, inquiry and review to the extent practical. However, such information is often not capable of external verification or validation.

Metallica has agreed to indemnify Advisory Partner and their partners, directors, employees, officers and agents (as applicable) against any claim, liability, loss or expense, costs or damage, arising out of reliance on

any information or documentation provided by Metallica, which is false and misleading or omits any material particulars, or arising from failure to supply relevant documentation or information.

Advisory Partner is a Corporate Authorised Representative of AP Lloyds Pty Ltd ACN 643 090 359 Australian Financial Services Licence 526061. As a Corporate Authorised Representative of an Australian Financial Services Licence, we are required to provide a Financial Services Guide in situations where we may be taken as providing financial product advice to retail clients. A copy of Advisory Partner Financial Services Guide is set out in the beginning of this Report.

3.4 Basis of evaluation

In forming our opinion as to whether or not the Offer is fair and reasonable for the Shareholders of Metallica, we have considered the following.

The Corporations Act does not define the expressions “fair” and “reasonable”. However, guidance is provided by the Regulatory Guides issued by ASIC, which establish certain guidelines in respect of independent expert’s reports required under the Corporations Act or commissioned voluntarily. In particular, Regulatory Guide 111 “Content of Expert Reports” (RG 111) has been considered.

RG 111 draws a distinction between “fair” and “reasonable”. An offer is fair if the consideration is equal to or greater than the value of the securities subject to the offer. The comparison must be made assuming 100% ownership of the target company irrespective of the percentage holding of the bidder or its associates in the target company.

RG 111 considers an offer to be “reasonable” if:

- The offer is “fair”; or
- Despite not being “fair”, the expert believes that there are sufficient reasons for security holders to accept the offer in the absence of any higher offer.

RG 111 sets out some of the factors that an expert might consider in assessing the reasonableness of an offer including:

- The bidder’s pre-existing voting power in the target company;
- Other significant security holding blocks in the target;
- The liquidity of the market in the target’s securities;
- Taxation losses, cash flow or other benefits arising through achieving 100% ownership of the target;
- Any special value of the target to the bidder;
- The likely market price if the offer is unsuccessful; and
- The value to an alternative bidder and likelihood of an alternative offer being made.

In our opinion, the Offer will be fair if the value is greater than the market value of the securities in Metallica Minerals, inclusive of an appropriate premium for control.

In considering whether the Offer is reasonable, other factors that have been considered include:

- Current financial performance and forecast performance;
- The likelihood of an alternative offer and alternative transactions;
- The likely market price of Metallica Group shares in the absence of the offer; and
- Other advantages and disadvantages for Metallica’s Shareholders of approving the Proposed Transaction.

We have not considered special value in forming our opinion. Special value is the amount which a potential acquirer may be prepared to pay for a business in excess of the fair market value. This premium represents the value to the potential acquirer of potential economies of scale, reduction in competition or other synergies arising from the acquisition of the asset not available to likely purchasers generally. Special value is not normally considered in the assessment of fair market value as it relates to the individual circumstances of special purchasers.

3.5 Reliance on Information

This Report is based upon financial and other information provided by Metallica. Advisory Partner has considered and relied upon this information. Advisory Partner believes the information provided to be reliable, complete and not misleading, and has no reason to believe that any material facts have been withheld. The information provided was evaluated through analysis, inquiry and review for the purpose of forming an opinion as to whether the Offer is fair and reasonable.

Metallica has agreed to indemnify Advisory Partner, and the directors, partners and employees of Advisory Partner and any related entity against any claim arising out of misstatements or omissions in any material supplied by Metallica, its subsidiaries, directors or employees, on which Advisory Partner has relied.

Advisory Partner does not warrant that its inquiries have identified or verified all of the matters which an audit, extensive examination or "due diligence" investigation might disclose. In any event, an opinion as to whether a corporate transaction is fair and reasonable is in the nature of an overall opinion rather than an audit or detailed investigation. Preparation of this Report does not imply that Advisory Partner has audited in any way the financial accounts or other records of the Company.

It is understood that the accounting information provided to Advisory Partner was prepared in accordance with generally accepted accounting principles and except where noted, prepared in a manner consistent with the method of accounting used by the Company, in previous accounting periods.

An important part of the information base used in forming an opinion of the kind expressed in this report are the opinions and judgement of management. This type of information was also evaluated through analysis, inquiry and review to the extent practical. However, such information is often not capable of external verification or validation.

3.6 Current Market Conditions

Our opinion is based on economic, market and other conditions prevailing at the date of this Report. Such conditions can change significantly over relatively short periods of time. Accordingly, changes in those conditions may result in any valuation opinions becoming quickly outdated and in need of revision. Advisory Partner reserves the right to revise any valuation, or other opinion, in the light of material information existing at the date of this Report that subsequently becomes known to Advisory Partner.

3.7 Sources of Information

Appendix A to this Report sets out details of information referred to and relied upon by Advisory Partner during the course of preparing this Report and forming our opinion.

3.8 Assumptions

In forming our opinion, the following has been assumed:

- All relevant parties have complied, and will continue to comply, with all applicable laws and regulations and existing contracts and there are no alleged or actual material breaches of the same or disputes (including, but not limited to, legal proceedings), other than as publicly disclosed and that there has been no formal or informal indication that any relevant party wishes to terminate or materially renegotiate any aspect of any existing contract, agreement or material understanding, other than as publicly disclosed;

- That matters relating to title and ownership of assets (both tangible and intangible) are in good standing, and will remain so, and that there are no material legal proceedings, or disputes, other than as publicly disclosed;
- Information in relation to the Offer provided to the Shareholders or any statutory authority by the parties as part of the bidder's statement or the target's statement is complete, accurate and fairly presented in all material respects; and
- The legal mechanisms to implement the Offer are correct and effective.

4.0 Business Environment

In arriving at our valuation opinion, we have considered the outlook for the Australian economy and the relevant industry affecting Metallica's.

4.1 Economic Analysis

The economic growth of advanced economies has been slow, with the United States being the most robust. This has been evident in GDP data along with indicators such as retail sales and investment intentions. Consumption growth has been slow in advanced economies driven by weakness in goods consumption despite positive growth in real household incomes throughout 2023. Many economies saw saving rates remain higher than pre-pandemic levels and any savings accumulated during COVID-19 are yet to be drawn down. It is expected that more moderation in inflation should reduce the cost-of-living pressures on income levels, supporting consumption growth. However, this may partially be offset as higher cash rates cause the labour market to ease, while increasing loan repayments which may impact household income. This was reflected in most advanced economies, where the labour market has eased gradually since the recent rate hikes of 2023.

Domestically, Australia's GDP growth remains subdued as the level of demand continues to exceed supply. This slowing in GDP growth over the last year has been driven by low growth in household consumption during cost-of-living pressures. Investments into dwellings has also slowed due to labour constraints, especially in the residential construction sector. For the past two years, Australian households saw their real disposable incomes decline, placing pressures on their budgets. Despite the strong growth in nominal labour incomes, the high rate of inflation and high rate of tax payments have offset this effect. This resulted in households by reducing spending, especially for discretionary items. Unlike other economies, Australian households responded to lower real incomes by saving less or drawing down on their savings. The RBA reports that transaction-based spending data implies that nominal spending growth has slowed across most households. Further, mortgagors have faced a large increase in their mortgage payments, due to higher interest rates. However, many investors were able to offset this impact by drawing down on their savings. Overall, Australian households had to adjust in response to the high cost-of-living pressures, especially for households with lower financial buffers.

Housing prices, a good indicator of household wealth, has rebounded over 2023, reaching a new high since the peak of April 2022. House prices have increased amongst most Australian capital cities and regional areas, although price growth has decreased in Sydney and Melbourne. This rebound is reflected by stronger demand for dwellings combined with limited supply due to population growth. Moreover, due to higher interest rates, the economy saw a weakness in dwelling investment. With the rental market remaining tight, and limited supply of rental properties, vacancies at major cities have remained tight, averaging approximately 2% in 2023.

Inflation is forecast to decline to 3.5% by the end of 2024, and further below 3% by 2025. Goods prices have accounted for majority of the decline in inflation to date and is expected to continue falling in the short-term. However, services inflation remains above target but is expected to gradually ease to the end of 2025. In the coming years it is expected there will be an improved balance in the supply and demand across the economy, including labour and product markets, which is expected to support lower inflation while GDP returns to growth. The cash rate is projected to peak at 4.5% before declining to 3.5% by the end of 2025. This has been increased since the August statement. The exchange rate is assumed to remain unchanged at the current level.

The economic outlook is fairly positive going into 2024 as inflation and GDP are expected to trend a return to historical norms. These conditions may provide markets reasonable confidence that companies will continue to operate business as usual. As such, we do not believe that Metallica Minerals will be adversely affected by these economic factors in the near future.

4.2 Industry Analysis

Metallica Minerals' main product is [the mining and production of](#) high-quality Silica sand. Traditionally, this commodity was used for the production of glass, foundry, and other chemical industries. However, in recent years, Silica sand has been growing demand in the renewable energy sector for the production of photovoltaic cells in solar panels.

The demand for High Purity Silica Sand (HPPS) has been growing rapidly in Asia over the last 5-years with a CAGR of 8.4%. China's demand for imported silica sand has grown faster at 27.9% CAGR, resulting in a foreseeable deficit of 4 million tonnes (Mt) or more by 2026. The main driver for this demand is the increasing need for photovoltaic (PV) glass in the solar industry, which relies heavily on the supply of HPSS.

Australia has been the dominant supplier of HPPS Asia-Pacific markets, particularly China, Japan, Taiwan, and South Korea, with exports totalling 3,897,978 metric tonnes. The high purity silica sand produces at Cape Flattery is well-positioned to meet this demand due to its specification, logistics advantages and because it is already a well-recognised product.

The demand for HPSS is expected to continue its exponential growth driven by the structural transition from fossil fuels to renewables, and specifically solar. China remains the leading global producer of solar glass, with HPSS making up approximately 72.2% of every 100kg of PV glass.

Competition for supply of Australian HPSS exists primarily from domestic suppliers in China and seaborne suppliers from Indonesia and Malaysia. However, China will not be able to meet the demand of HPSS unless there is a significant increase in its silica sand acid washing capacity and efficiency. Indonesia entered the market in 2020 and ships its silica sand almost exclusively to China, while Malaysia supplied 1,333,000 MT of silica sand exports to China in 2022.

The demand for HPSS is underpinned by long-term global growth drivers, including the shift towards renewable energy and the transition away from fossil fuels. Solar power generation is a key driver for the demand of HPSS, as it is an essential ingredient in the production of photovoltaic glass.

5.0 Metallica Minerals

5.1 Company overview

Metallica Minerals Limited engages in the development, evaluation, and exploration of mineral properties in Australia. It explores for silica sand, copper, and gold projects. The company's flagship property is the 100% owned Cape Flattery Silica Sand Project covering an area of 36 Km2 exploration tenure located in Northern Queensland. Metallica Minerals Limited was incorporated in 1997 and is based in Fortitude Valley, Australia.

5.2 Projects

The table below highlights the key projects and their descriptions.

Table 5: Metallica Minerals' Projects

Project	Description
Cape Flattery Silica Sand	The Cape Flattery Silica Sand project is located on the eastern coastline of Cape York Peninsula and adjacent to the Cape Flattery Silica Sand operation owned by Mitsubishi. Metallica's CFS project has completed and released a Definitive Feasibility Study.
Clermont	The Clermont Copper/Gold Project is situated near the town of Clermont in central Queensland. The project is prospective for porphyry and stratabound strata bound bulk tonnage copper/gold deposits along with mesothermal gold deposits.

Source: Capital IQ

Advisory Partner ~~has excluded Clermont in the valuation section as the project~~notes this project is yet to have JORC resources identified. ~~As there is no reasonable analysisWe were able to rely upon, we are unable to determineidentify a value-comparable transaction in the sale of the potential resources held in this project~~Nullagine Gold Project on December 2023.

We note that the project is jointly owned by Metallica (51%) and Diatreme (49%) so any value applied to the Clermont project would have a proportionate affect to both companies.

5.3 Cape Flattery Silica Sand Project (CFS)

Metallica Minerals announced an updated Definitive Feasibility Study (DFS) Cape Flattery Silica Sand Project in November 2023. This project holds 47 million tonnes (Mt) of Probable Ore Reserves @ 99.18% SiO2 which is to be processed across the 15-year life of the project. The Updated DFS does not include the inferred resources for the Western Area of EPM 25734. The DFS was prepared by Metallica Management with support from Turner & Townsend JukesTodd.

The CFS Project is designed to utilise conventional mining equipment and 'off the shelf' processing plant within the same, small footprint.

The report by Paemac indicates the Metallica infrastructure solution as detailed in the Definitive Feasibility Study may have some advantage. While it is difficult to quantify this advantage, we think it important for shareholders when considering the merits the transaction.

The key components of the project are:

- Silica sand processing plants;
- Overland conveyor from the product stockpile to the Jetty Infrastructure Area (JIA);
- Barge Loading Facility (BLF) and associated jetty (located two to three nautical miles to ocean going ~~transshipment~~transshipment zone;
- Material Offload Facility (MOF) for delivery of personnel and supplies by marine vessels;
- Purpose-built accommodation facility for 52 people;
- Barging and ~~transshipment~~transshipment operations
- Site access road to the jetty;
- Site-wide services;

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- Mine Infrastructure Area (MIA) facilities; and
- Two (2) Product stockpile of 100,000 tonnes each.

5.4 CFS Project Resources & Reserves

The Probable Ore Reserve of 47Mt at 99.11%SiO₂ represents 95% of the Mineral Resource of 49.5Mt at 99.10% SiO₂. The following is an overview of the resource category areas within Metallica mining lease.

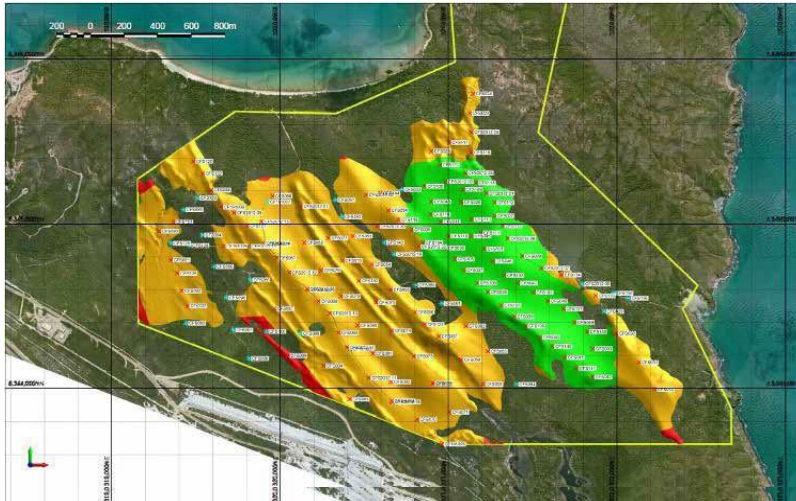


Image 51: Overview of Drillholes and Resource Category Areas with Mining Lease (ML) boundary.

Metallica Minerals owns mineral resources of 49.5 Mt which includes results from 2019 drilling campaigns (hand auger), December 2020, July/August 2021, and December 2021. The data from these drilling campaigns were used to in the resource estimate for the CFS project.

Table 6: Metallica Minerals Ore Reserves

Ore Reserve	Tonnage (Mt)	SiO ₂ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	Al ₂ O ₃ (%)	LOI (%)	Waste Mt
Probable Reserve	47	99.11	0.09	0.14	0.15	0.24	4.0

Source: Metallica Minerals, Definitive Feasibility Study November 2023

Table 7: Metallica Minerals JORC Resources

Resource Category	Tonnage (Mt)	SiO ₂ (%)	Fe ₂ O ₃ (%)	TiO ₂ (%)	Al ₂ O ₃ (%)	LOI (%)	Density t/m ³	Silica Sand Mm ³
Measured	16.1	99.20	0.08	0.12	0.22	0.13	1.6	10.1
Indicated	33.2	99.05	0.1	0.18	0.25	0.15	1.6	20.7
Inferred	0.2	99.00	0.12	0.27	0.28	0.13	1.6	0.1
Total	49.5	99.10	0.09	0.16	0.24	0.14	1.6	30.9

Source: Metallica Minerals, Definitive Feasibility Study November 2023

5.5 Exploration Tenements

As at the date of this report, Metallica holds the following tenements:

Table 8: Metallica Minerals' Tenements

Tenement	Project	Status	Commenced	Grant	Expiry	Area HA	Area S/B	Area Km ²
EPM 25734	Cape Flattery	C	25/05/2015	25/05/2020	24/05/2025	0	11	54.4
ML 100284	Cape Flattery	A	15/06/2021	-	-	615.9	0	-

Source: Metallica Minerals

5.6 Key Personnel

The Executives and Directors of Metallica are detailed in the table below.

Table 9: Executives of Metallica Minerals

Name & Position	Description
Theo Psaros Executive Chairman	Theo Psaros, GAICD, CA, BFinAdmin, is the Executive Chairman of Metallica Minerals Limited since May 21, 2020, with extensive experience in key executive and resource industry roles, including CFO and COO of MetroCoal Limited. He has also served as Non-Executive Director at Mobilicom Limited from January 20, 2021, to July 05, 2021.
Mark Bojanjac Non-Executive Board Director	Mark Trevor Bojanjac, B.com, CA, ICAA, is an Independent Non-Executive Director of Metallica Minerals Limited since May 13, 2021. He serves as Executive Chairman of PolarX Limited and has held various roles, including CEO of Adamus Resources Limited. Bojanjac, a Chartered Accountant, has a successful track record in developing resource companies and co-founding gold projects in Australia, Mongolia, and China.
Brad Sampson Non-Executive Board Director	Stuart Bradley Sampson, also known as Brad, is an Independent Non-Executive Director at Metallica Minerals Limited since May 13, 2021. With extensive resources industry experience, he served as the CEO of Kore Potash Plc and Tiger Resources Limited. Sampson has held leadership roles covering the entire mining cycle, including exploration, development, operations, and closure. He is a seasoned business leader, director, and mining professional with notable contributions to the Australian resources industry.
Scott Waddell CFO & Company Secretary	Andrew Scott Victor Waddell, B.Bus, FCPA, AGIA, is the CFO of Metallica Minerals Limited since May 21, 2020 and Company Secretary since December 8, 2020. Previously an Interim CEO until May 21, 2020 and Executive Director from February 2019 until August 31, 2021. With rich resources experience from companies like Metro Mining Ltd. Cape Alumina Ltd, Anglo American Metallurgical Coal, and Rio Tinto Alcan, he brings expertise in finance and business improvement. A Fellow of CPA, he holds postgraduate qualifications and is an Associate Member of the Governance Institute of Australia.
Sam Fisher Commercial General Manager	Sam Fisher is a highly credentialled senior executive, with demonstrated commercial success over 25 years in the resources and mining sector, specialising in multi-commodity strategy, sales, trading and marketing, logistics and supply chain. He is experienced in strategic business development, identifying and developing new business opportunities, developing new markets, and strengthening existing relationships. Sam joined Metallica Minerals on 17 October 2022.
Nicholas Villa CFS Project General Manager	Nicholas Villa, BSc (Hons), DipPM, MAIG, has over 23 years' experience as a mining professional, he is well practiced in the delivery of resource projects, taking them from early exploration phase through to production. Nicholas has managed bulk commodity operations both as the Principal and as Contractor, fulfilling senior management roles including Mining Manager, Project Manager and Site Senior Executive. Thoroughly versed in Queensland resource project approvals processes including Environmental Studies and Native Title negotiations. Nicholas was Project Manager for the team that successfully delivered Metro Mining's Bauxite Hills mine to full production in Northern Cape York. Nicholas joined Metallica Minerals in June 2021.

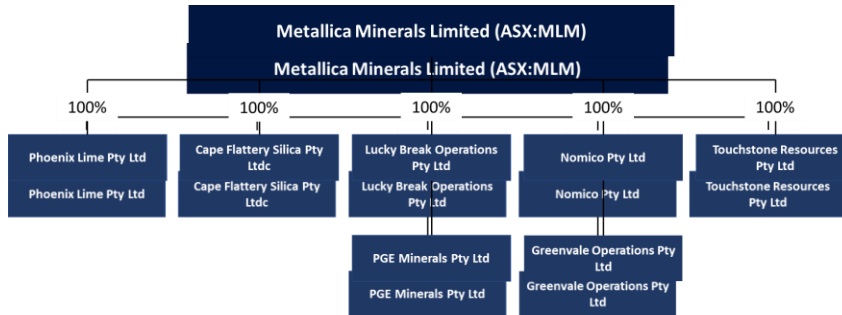
Name & Position	Description
Pat Smith Geology/Exploration Manager	Pat Smith, BSc, MScMiningGeol, MAusIMM, serves as the Geology/Exploration Manager at Metallica Minerals Ltd. With a background in Cyprus Gold and Arimco Gold Pty Ltd, he excels in exploration across Australia, Papua New Guinea, and the Solomon Islands. Graduating from the Cambourne School of Mines in 1987, Mr. Smith brings diverse expertise, from grassroots exploration to feasibility studies.

Source: Metallica Minerals Management

5.7 Ownership and Capital Structure

Metallica has the following 100% owned subsidiaries:

Figure 1: Metallica's Corporate Structure



Source: Metallica Minerals Management

As at 31st of December 2023, Metallica has 959,923,922 total shares outstanding. The top 10 shareholders and total ordinary shares as at 31st of December 2023 are summarised below.

Table 10: Top 10 Shareholders as at 31st of December 2023

As of 31st of December 2023 Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital
Ilwella Pty Ltd	231,451,245	24.11%
Sibelco Asia Pacific Pty Ltd	157,715,500	16.43%
Sparta AG	92,046,350	9.59%
Dostal Nominees Pty Ltd	29,359,998	3.06%
Rookharp Capital Pty Ltd	24,680,450	2.57%
Citicorp Nominees Pty Ltd	14,570,652	1.52%
Gefrato Tading Pty Ltd	10,100,000	1.05%
Plan-1 Pty Ltd	9,712,501	1.01%
Shadbolt Future Fund (Tottenham) Pty Ltd	8,190,000	0.85%
Sophjak Pty Ltd	7,026,315	0.73%
Top 10 Shareholders	584,853,011	60.93%
Other Shareholders	375,070,911	39.07%
Total Issued Shares	959,923,922	100.00%

Source: Metallica Minerals

5.8 Outstanding Options

At 31st of March 2024, the following is the total unissued ordinary shares of MLM under option.

Table 11: Metallica Minerals' Options

Grant Date	Expiry Date	Exercise Price	Number under option
3 August 2011	No Expiry Date*	0.7	1,000,000
29 November 2023	29 November 2028	0.045	32,000,000
Total			33,000,000

Source: Metallica Minerals Annual Report FY23 & Metallica Minerals Management

The options granted in August 2011 are subject to expire 3-years after the decision is made to mine at Lucknow or Kokomo. As at the date of this report, the share price of Metallica Minerals Limited is 0.024.

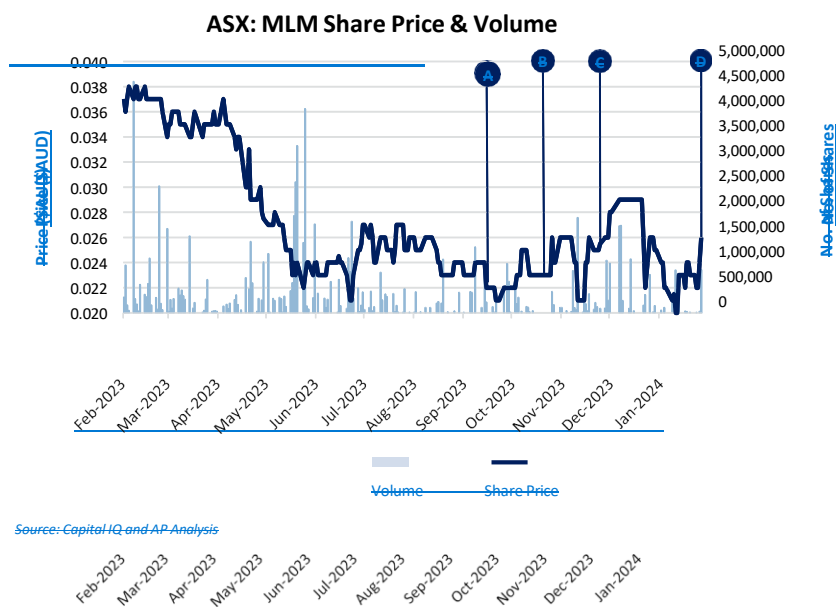
5.9 Share Price Analysis

In order to assess the reliability of using the traded market price of MLM's shares as a basis for determining the fair market value of the shares in MLM we have had regard to:

- the liquidity of the stock over the trading period;
- the 'spread' of ordinary shareholders and the total number of ordinary shares that they hold in the Company, taking into account any trading or other restrictions applicable to the quoted ordinary shares;
- the level of trading activity of the quoted ordinary shares in the Company (i.e. the volume of trades of the quoted ordinary shares in the market as a percentage of the total quoted ordinary shares, and the frequency of the trades);
- the number and frequency of 'unusual' and/or 'abnormal' trading that takes place in the Company's-quoted ordinary shares;
- the presence of any factors that may indicate that trading in the shares is the result of significant speculative trading; and
- the level of knowledge that the 'willing' buyers and sellers have in respect of the Company and the market in which it operates.

We have analysed Metallica's daily share close price and volume traded during the period from 16th of February 2023 to 16th of February 2024.

Figure 2: Metallica Share Price Analysis



Source: Capital IQ and AP Analysis

A comprehensive list of events disclosed by Metallica's company announcements during the past year which may have impacted Metallica's share price movements and trading volumes are set out on the following

page. Announcements which may have corresponded to a significant impact (> 10%) on shares prices and trading volumes are highlighted.

Table 12: Metallica's Recent Company Announcements

Date	Announcement	Event	Share Price:	Share Price:	% Change
			Prior Day Share Price	Share Price on Announcement	
			Day Prior to Announcement	Announcement Day	% Change
12 February 2024	Cape Flattery Silica Sand Project Update	D	0.023	0.023	0%
	Update		0.023	0.023	0%
30 January 2024	Change of Director's Interest Notice x 3		0.021	0.0215	2%
	Notice x 3		0.021	0.0215	2%
15 December-2023	CFS Project declared a Coordinated Project	C	0.025	0.0255	2%
	Coordinated Project		0.025	0.0255	2%
12 December-2023	Cape Flattery Silica signs MOU with Eternal Asia		0.025	0.025	0%
	with Eternal Asia		0.025	0.025	0%
11 December 2023	Drilling Commences at Leo				
11 December 2023	Drilling Commences at Leo				
	Grande Graphite / Gold Prospect		0.026	0.025	-4%
22 November-2023	Results of Annual General Meeting		0.026	0.026	0%
	Meeting		0.026	0.026	0%
20 November-2023	Metallica Minerals webinar and update		0.024	0.026	8%
	update		0.024	0.026	8%
14 November-2023	Cape Flattery Silica Updated DFS Supports 3MTPA Sales	B	0.023	0.023	0%
	Supports 3MTPA Sales		0.023	0.023	0%
31 October 2023	Supplementary Notice of Annual General Meeting		0.025	0.024	-4%
	General Meeting		0.025	0.024	-4%
11 October 2023	Appendix 4G		0.022	0.021	-5%
25 September-2023	Cape Flattery Silica Sand Project Update	A	0.023	0.023	0%
	Update		0.023	0.023	0%
19 September 2023	Bulk metallurgical tests confirm				
19 September 2023	Bulk metallurgical tests confirm				
	High Purity Silica at-CFS		0.024	0.024	0%
5 September-2023	Revised Change of Director's Interest Notice		0.025	0.024	-4%
	Interest Notice		0.025	0.024	-4%
25 August 2023	Change of Director's Interest Notice		0.025	0.025	0%
	Notice		0.025	0.025	0%
24 August 2023	Application for quotation of securities - MLM		0.025	0.025	0%
	securities - MLM		0.025	0.025	0%
17 August 2023	Change in substantial holding		0.025	0.025	0%
3 August 2023	Change of Director's Interest Notice x 3		0.026	0.026	0%
	Notice x 3		0.026	0.026	0%
1 August 2023	Lapse of Performance Rights		0.026	0.026	0%

17 July 2023	Cape Flattery Silica DFS confirms excellent economics	0.023	0.025	9%
5 July 2023	Further drilling completed at Clermont (EPM17968)	0.024	0.0245	2%
28 June 2023	QLD Govt new critical mineral strategy - Cape Flattery	0.023	0.024	4%
1 June 2023	Extension of MOU to explore off-take arrangements	0.027	0.026	-4%
17 May 2023	Change in substantial holding	0.0295	0.03	2%
11 May 2023	Cape Flattery Silica Sand Project Update	0.033	0.029	-12%
15 March 2023	Results of General Meeting	0.037	0.037	0%
13 March 2023	Change in substantial holding	0.037	0.037	0%

3 March 2023	Maiden Inferred Resource of 12Mt estimated for CFS West CFS Project Federal	0.037	0.037	0%
20 February 2023	Environmental Approval Process Update	NA	0.036	-

Source: Capital IQ, ASX, AP Analysis

Notable announcements which may have had a significant impact on Metallica's share price include:

- 19/02/2024 - Gold Exploration Target established for Leo Grande Project**
 The company had announced a JORC exploration target of 150,000 – 2,300,000 ounces of gold at the project. The quantity and grade of the target is conceptual in nature and is an approximation. The project is yet to estimate a mineral resource.
- 19/02/2024 - Diatreme intention to make takeover offer for Metallica Minerals**
 Metallica Minerals issued a response regarding Diatreme's conditional intention to make a takeover bid announced on the 16th of February 2024. The Metallica Board recommended that shareholders take no action pending a formal response and recommendation from the Metallica Board.
- 11/05/2023 - Cape Flattery Silica Sand Project Update**

Metallica Minerals announced an update regarding the Cape Flattery Silica Sand Project, stating the definitive feasibility study is advancing for the project. The recent requirement for an Environmental Impact Statement (EIS) will result in delays to the project's approval and timing on construction.

The following tables outline Metallica's trading data. The past 12-months of trading data was used to determine daily turnover and monthly volumes. Typically, the large sophisticated and founding shareholders of small-cap companies are not traders of their shares.

Table 13: Metallica's Share Overview

Company	Ticker	Shares Outstanding	Free Float
Metallica Minerals	ASX:MLM	959,923,922	431,293,818

Source: Capital IQ

The following table is a summary of Metallica Mineral's 12-month trading data including average daily volume, low price, high price, and closing price.

Table 14: Metallica's ASX Trading Data [Metallica 12 month trading data](#)

ASX:MLM	Avg. Daily Volume	Low (\$AUD)	
Month Ended			
Mar-23	458,598	0.034	
Apr-23	181,577	0.034	
May-23	339,559	0.027	
Jun-23	847,840	0.022	
Jul-23	355,196	0.021	
Aug-23	111,994	0.024	
Sep-23	200,468	0.023	
Oct-23	233,099	0.021	
Nov-23	84,112	0.023	
Dec-23	464,747	0.021	
Jan-24	178,320	0.020	
Feb-24	125,996	0.020	

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- ~~#Note: Feb-24 contains data up to 16th of February 2024=~~
- ~~Source: Capital IQ & AP Analysis~~

Given the above data, we note the following regarding Metallica's trading data:

- ~~the share price peaked at \$0.038 in March 2023 and reached a low of \$0.020 in February~~
- ~~2024, average daily volumes ranged from 84,112 in November 2023 to 888,213 in June 2023.~~

1.1 Liquidity Analysis

~~The following table displays the volume for each month in the past year, as well as the percentage of total and free float shares for each given month. To reflect the liquidity of common stock in Metallica Minerals we have included equity listings for:~~

- DB:MM4 listed on Deutsche Boerse AG
- ASX:MLM listed on Australian Securities Exchange
- CHIA:MLM listed on Chi-X Australia
- OTCPK:MLMZ.F listed on OTC Pink

Table 15: Metallica's Liquidity Analysis

Month End	Volume Traded	Volume Traded as % of Total Shares	Cumulative Volume Traded as % of Total Shares	Volume Traded as % of Free Float Shares	Cumulative Volume Traded as % of Free Float Shares
Mar 2023	11,663,883	1.2%	1.2%	2.7%	2.7%
Apr 2023	4,094,162	0.4%	1.6%	0.9%	3.7%
May 2023	8,768,965	0.9%	2.6%	2.0%	5.7%
Jun 2023	21,567,304	2.2%	4.8%	5.0%	10.7%
Jul 2023	10,561,374	1.1%	5.9%	2.4%	13.1%
Aug 2023	2,860,363	0.3%	6.2%	0.7%	13.8%
Sep 2023	4,660,707	0.5%	6.7%	1.1%	14.9%
Oct 2023	5,524,663	0.6%	7.3%	1.3%	16.2%
Nov 2023	2,114,460	0.2%	7.5%	0.5%	16.7%
Dec 2023	12,381,419	1.3%	8.8%	2.9%	19.5%
Jan 2024	4,552,247	0.5%	9.2%	1.1%	20.6%
Feb 2024	4,447,648	0.5%	9.7%	1.0%	21.6%
Min	2,114,460	0.2%		0.5%	
Average	7,766,433	0.8%	-	1.8%	
Median	5,092,685	0.5%		1.2%	
Max	21,567,304	2.2%		5.0%	

*Note: Feb-24 contains data up to 16th of February 2024

Source: Capital IQ & AP Analysis

*Note: Feb-24 contains data up to 16th of February 2024

Source: Capital IQ & AP Analysis

We note the following regarding Metallica's volume and liquidity data from March 2023 to February 2024:◆

- the cumulative volume traded of total shares is 9.7% over this period.
- ◆ the maximum monthly volume traded as a percentage of total shares is 2.2%.◆
- the cumulative volume of free float shares is 21.6%.
- ◆ the maximum monthly volume traded as a percentage of free float is 5.0%.
- ◆ monthly volumes ranged from 2,114,460 in November 2023 to 21,567,304 in June 2023.

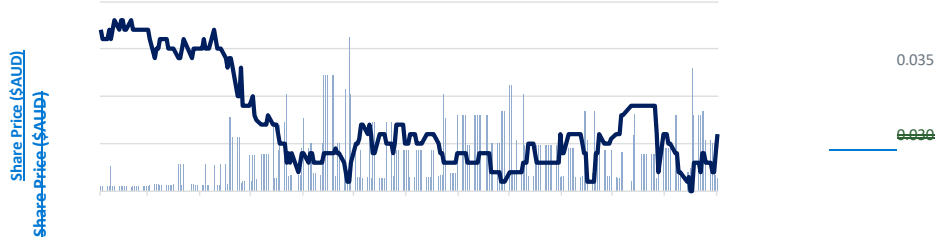
We have analysed the bid and ask spread in trading data for the previous 12-months. The below chart demonstrates the bid and ask spread from 16th of February 2023 to 16th of February 2024.

Figure 3: Metallica's Bid-Ask Spread

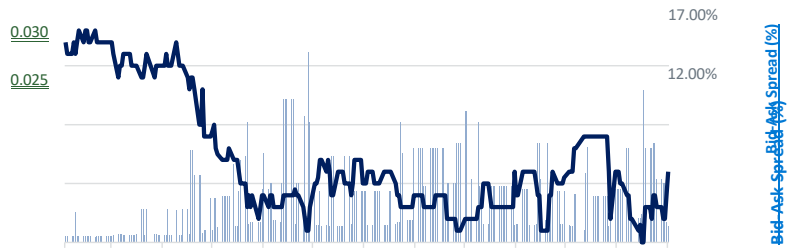
ASX:

MLM Bid-Ask Spread Analysis

0.040 27.00%



22.00%





Source: Capital IQ and AP Analysis

Date
■ Bid-Ask Spread ■ Share Price

In regard to the data provided above, we note the following:

- the minimum spread is 2.56%
- the median spread is 6.90%
- the average spread is 6.94%
- the maximum spread is 22.22%

We consider Metallica Minerals shares to be illiquid based on an average bid-ask spread of 7% and an annual cumulative volume as a percentage of total shares under 10%.

5.10 Volume Weighted Average Price

We have reviewed the following factors relating to the trading activity of MLM's shares on the ASX:

- the daily high, low and closing share price of trades of MLM;
- the daily volume of MLM share trading; and
- the volume weighted average share price ("VWAP") of MLM.

Table 16: Metallica's VWAP

Metallica VWAP	Low	High	VWAP
Up to 16th February 2024			
1 Day	0.0200	0.0380	0.0257
5 Day	0.0208	0.0376	0.0256
10 Day	0.0213	0.0373	0.0246
1 Month	0.0222	0.0368	0.0225
2 Month	0.0227	0.0363	0.0264
3 Month	0.0229	0.0350	0.0255

Source: Capital IQ & AP Analysis

We note the following regarding with respect to the share price of MLM in the 3-months leading up to the intention to takeover announcement on the 19th of February 2024.

- The VWAP ranges from \$0.0225 (1-month) to \$0.0264 (2-month).
- The 3-month VWAP is at \$0.0255 which is lower than the offer.

5.11 Capital Raisings

The following is a complete capital raising history of Metallica Minerals. The recent higher offer was 145m shares at \$0.035 announced on 30th of November 2022. This is a substantial raising as it accounts for 15.1% of the current outstanding share count.

Table 17: Metallica Minerals' Recent Capital Raisings

Announce Date	Offering Type	Offering Price	Shares Offered	Total Capital
30 November 2022	Private Placement - Common Stock	0.035	145,000,000	5,075,000
30 November 2022	Common Stock - Subscription Rights Offering	0.032	141,199,221	4,518,375
16 February 2022	Private Placement - Common Stock	0.031	97,903,226	3,035,000
20 September 2021	Common Stock - Other	NA	NA	NA
22 April 2021	Common Stock - Other	0.030	71,166,665	2,135,000
25 March 2021	Common Stock - Subscription Rights Offering	0.030	162,188,704	4,865,661
19 April 2017	Common Stock - Other	0.050	5,377,769	268,888
3 September 2017	Common Stock - Subscription Rights- Offering	0.050	58,822,231	2,941,112

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25 February 2016	Common Stock - Subscription Rights Offering	0.030	59,871,319	1,796,140
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25 February 2016	Common Stock—Subscription Rights Offering		0.030	59,871,319	1,796,140
18 August 2014	Private Placement - Common Stock	0.080	6,250,000		500,000

Source: Capital IQ & Metallica Management

5.12 Historical Profit and Loss

We detail below the past 3 years Profit and Loss for Metallica.

Table 18: Metallica's historical Profit and Loss

Consolidated Statements of Comprehensive Income	Actual			
	FY21	FY22	FY23	HV24*
Revenue				
Revenues	49,221	4,182	NA	NA
Interest Revenues	8,034	7,770	86,482	92,470
Other Income	220,342	2,500	NA	NA
Total Revenue	277,597	14,452	86,482	92,470
Expenses				
Employee Benefit Expense	-372,460	-857,204	-634,829	-761,013
Rental Expenses	-89,936	-41,413	-28,654	-164,688
Professional Fees	-113,436	-148,033	-265,797	-138,814
Legal Fees	-50,545	-35,911	-65,281	-26,355
Extraordinary General Meeting Costs	-6,000	-14,667	NA	NA
Airfares and Conferences	-41,254	-37,521	-73,924	-9,856
Exploration Costs	-279,878	-306,391	-77,035	-55,648
Impairment of Exploration and Evaluation Expenditure	NA	NA	-635,494	NA
Other Expenses	-214,305	-388,886	-345,243	-172,159
Depreciation and Amortization	-18,421	-85,372	-111,453	-54,435
Finance Costs	NA	-18,516	-19,683	-8,891
Listing Fees and Registry Expense	-96,599	-87,732	-78,084	-55,415
Net Loss on Disposal of Subsidiary and Joint Operation	-2,049,754	NA	NA	NA
Total Expenses	-3,332,588	-2,021,646	-2,335,477	-1,299,054
Pre-tax Income	-3,054,991	-2,007,194	-2,248,995	-1,206,584
Taxes and Other Expenses				
Income Tax	0	0	0	0
Loss For The Period	-3,054,991	-2,007,194	-2,248,995	-1,206,584

Source: Capital IQ

5.13 Historical Balance Sheet

We detail below the historical balance sheet for Metallica as at 30 June 2021, 2022 and 2023.

Table 19: Metallica's Historical and Current Balance Sheet

Consolidated Statements of Financial Position	FY21	Actual FY22	FY23	HY24*
ASSETS				
Current Assets				
Cash and Cash Equivalents	7,531,567	5,259,695	7,106,924	4,821,125
Trade and Other Receivables	45,923	59,525	23,432	33
Total Current Assets	7,577,490	5,319,220	7,130,356	4,821,158
Non-Current Assets				
Right of Use Assets	NA	476,467	399,202	360,570
Exploration & Evaluation	1,183,081	5,160,459	10,382,182	11,790,539
Property, Plant and Equipment	10,788	100,105	103,812	94,073
Other Non-Current Assets	48,443	73,498	67,498	67,498
Total Non-Current Assets	1,242,312	5,810,529	10,952,694	12,312,680
Total Assets	8,819,802	11,129,749	18,083,050	17,133,838
LIABILITIES				
Current Liabilities				
Trade and Other Payables	382,022	838,600	670,910	417,056
Employee Benefits	11,447	39,713	94,534	98,485
Lease Liabilities	NA	63,163	68,878	71,870
Total Current Liabilities	393,469	941,476	834,322	587,411
Non-Current Liabilities				
Lease Liabilities	NA	425,282	356,404	319,585
Provisions	NA	3,842	3,842	3,927
Total Non-Current Liabilities	-	429,124	360,246	323,512
Total Liabilities	393,469	1,370,600	1,194,568	910,923
Net Assets	8,426,333	9,759,149	16,888,482	16,222,915
Equity				
Common Stock	50,896,470	53,865,383	63,293,132	63,447,229
Accumulated profit/loss	(42,689,884)	(44,697,078)	(46,696,420)	(47,903,004)
Reserves	219,747	590,844	291,770	678,690
Total Equity	8,426,333	9,759,149	16,888,482	16,222,915

Source: Capital IQ

5.14 Historical Cash Flow Statement

We detail below the historical Cash Flow Statement for Metallica as at 30 June 2021, 2022 and 2023.

Table 20: Metallica Historical Cash Flow Statement

Consolidated Statement of Cash Flows	FY21	Actual FY22	FY23	HY24*
Cash flow from operating activities				
Receipts from customers, government grants and other (inclusive of GST)	256,644	8,976	740	-
Payments to suppliers and employees (inclusive of GST)	(1,198,239)	(1,073,871)	(1,551,585)	(627,136)
Interest Received	8,034	7,770	86,482	92,470
Interest Paid	-	(18,516)	(19,683)	(8,891)
Net Cash Used in Operating Activities	(933,561)	(1,075,641)	(1,484,046)	(543,557)
Cash flows from investing activities				
Payments for property, plant and equipment	(5,665)	(110,302)	(37,895)	(6,063)
Payments for exploration and evaluation assets	(1,183,081)	(3,977,378)	(5,857,217)	(1,702,352)
Payments for security deposits	(15,805)	(25,055)	-	-
Receipt for security deposit	-	-	6,000	-
Sale proceeds - HMS plant and tenements	330,000	-	-	-
Proceeds from disposal of subsidiary and joint operation	41,737	-	-	-
Net Cash Used in Investing Activities	(832,814)	(4,112,735)	(5,889,112)	(1,708,415)
Cash flows from financing activities				
Proceeds from issue of shares	7,000,661	3,044,000	9,883,375	-
Share issue transaction costs	(500,524)	(78,087)	(599,825)	-
Repayment of lease liabilities principal	-	(52,409)	(63,163)	(33,827)
Net Cash Used in Financing Activities	6,500,137	2,913,504	9,220,387	(33,827)
Net increase/(decrease) in cash and cash equivalents	4,734,032	(2,271,872)	1,847,229	(2,285,799)
Cash and cash equivalents at the beginning of the financial year	2,797,535	7,531,567	5,259,695	7,106,924
Cash and cash equivalents at the end of the financial year	7,531,567	5,259,695	7,106,924	4,821,125

5.15 Silica Sand Market Overview

The 2026 pricing estimate for a high-grade low iron Cape Flattery HPSS product has been revised to FOB USD 54.00 to USD 65.00 / AUD 75.00 to AUD 90.28 per tonne as per the Prime Gain Limited market report. The revision is based on a larger foreseeable supply shortfall of HPSS, particularly to the PV glass industry where demand is growing exponentially. The pricing estimate assumes quality product is produced and reliably supplied at sufficient scale, with efficient logistics and freight access convenience.

Current CIF market pricing of high-grade low iron silica sand imported to China from Australia is in the region of USD 60.00 plus per tonne. Current domestic China supply of HPSS is pricing in the range of RMB 400 to RMB 460 / USD 57.85 to USD 66.54 per tonne (delivered to factory gate).

Pricing will vary according to contract terms and supply arrangements including quality and minimum volume commitments over time, terms of trade, cost of freight, nature of the buyer, buyer history, competition, and development in processing technology. Currently, there is insufficient supply of high-grade silica sand with low iron, driving the demand for seaborne imported product. This demand is driven by the PV glass industry across Asia, particularly in China. The demand for PV glass tracks solar panel demand, which is projected to grow per all IEA scenarios through to 2030 at a CAGR between 15% to 25% (the IEA uses a CAGR of 21.2% for solar power capacity).

In parallel, significant demand supply pressure is being experienced in relation to high grade quartz used in quartz crucibles for solar (demand 2022 to 2023 estimated growth of 37%), with corresponding increases in price of product. In relation to copper, there are foreseeable supply shortages and corresponding projected record pricing, demand being supported by the “green transition”.

6.0 Valuation of Metallica's Shares

6.1 Valuation Methodology Adopted

We have considered the various valuation methods as set out in Appendix B in the course of arriving at our valuation conclusion. In our opinion, the most appropriate method with which to value MLM is a sum of parts valuation for assets owned by Metallica Minerals. This valuation method considers the separate valuation of the assets and liabilities of a company. The valuation methodologies adopted for each key asset owned by Metallica Minerals is detailed below:

Table 21: Description of Metallica Minerals' Assets

Asset	Description
Cape Flattery Silica Sand Project	The company has a definitive feasibility study (DFS) which involved a detailed life of mine (LOM) model conducted by a technical expert which we have used in undertaking our valuation. To further assist in our analysis, we have engaged SRK to review and comment on the reasonableness of the assumptions underlying the Definitive Feasibility Study. Refer to Appendix A for a description of work that SRK was engaged to undertake. Study. Refer to Appendix A for a description of work that SRK was engaged to undertake.
Other resources	Metallica has other JORC deposits which may produce sales in the future and is not included in the Cape Flattery DFS. We have valued these resources based on an EV/Resources method.
Other assets and liabilities	We will consider the value of the remaining assets and liabilities of Metallica.

Source: AP Analysis

In assessing the most appropriate valuation method, we have provided reasons to reject other methodologies in valuing Metallica Minerals:

- We have assessed the liquidity of Metallica Minerals shares in Section 4.7 and concluded the shares are thinly traded. As such, we consider that the quoted market price valuation method is not appropriate to value the shares in the company.
- The company at the time of this report is not profitable, nor does it have a history of earnings in which a multiple can be applied to determine a value. It is generally not appropriate to apply a multiple of earnings to value a mining company due to the unique capital and operating requirements of each project, their respective exploration and development stages, environmental and regulatory factors along with other unique mining issues. These factors make it difficult to find a comparable company for valuation.
- We do not consider the Discounted Cash Flow (DCF) method to be appropriate to value Metallica Minerals as a whole as we do not have any reliable information with regard to future cashflows of the entire company. However, we do have reliable information in regard to the future cash flows in the Cape Flattery Silica Sand Project as per the Definitive Feasibility Study and have applied the DCF method to value these resources.

6.2 Sum of Parts

Asset-based valuations involve the determination of the fair market value of a business based on the net realisable value of the assets used in the business.

Valuation of net realisable assets involves:

- separating the business or entity into components which can be readily sold, such as individual business units or collection of individual items of plant and equipment and other net assets; and
- ascribing a value to each based on the amount that could be obtained for this asset if sold.

The value of the assets can be determined on the basis of:

- *orderly realisation*: this method estimates fair market value by determining the net assets of the underlying business including an allowance for the reasonable costs of carrying out the sale of assets, taxation charges and the time value of money assuming the business is wound up in an orderly manner. This is not a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value;
- *liquidation*: this is a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value; or
- *going concern*: the net assets on a going concern basis estimates the market value of the net assets but does not take into account any realisation costs. This method is often considered appropriate for the valuation of an investment or property holding company. Adjustments may need to be made to the book value of assets and liabilities to reflect their going concern value.

The value of assets as a going concern is the most appropriate way to value the shares in Metallica Minerals as the company is continuing business in the foreseeable future.

6.3 Surplus assets

Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company. These are assets which, if sold, would not impact on the revenue or profit generating capacity of the entity. There are no surplus assets in Metallica.

6.4 Premium for Control

When valuing a controlling interest, an appropriate allowance should be made for the premium for control, given the strategic benefit that a controlling interest would provide. Empirical evidence on premiums for control indicates that these premiums tend to range between 15% and 40%. ~~In assessing the appropriate premium for control we've considered As we have applied a sum of parts valuation method which includes a discounted cash flow valuation of the flagship project CFSS, we have already valued the company on a controlling basis.~~

- ~~The company does not derive revenue from the Cape Flattery Silica Sand Project as it is pre-development;~~
- ~~The company's Cape Flattery Silica Sand Project is in Definitive Feasibility Study stage;~~
- ~~The Cape Flattery Silica Sand Project is reasonably developed in infrastructure planning relative to Diatrema's projects. Metallica's Cape Flattery Silica Sand Project is at Definitive Feasibility Study stage whereas Diatrema's Northern Silica project is at Scoping Study Stage.~~
- ~~The company has limited ability to raise capital in its current form, due to illiquidity and low market capitalisation; and~~
- ~~The company has not been paying dividends.~~

~~Our view is that the circumstances mean that the control premium would be at the mid range and as a result we have selected 30%.~~

¹ Empirical Evidence of Control Premia:

CA ANZ Survey, September 2021: "For those using a standard control premium, the most common range adopted is 20-25%".

RSM Control Premium Study, 2021: "In the 15.5-year period ended 31 December 2020, the average implied 20-day pre-bid control premium for the Australian Market is 34.7%, whilst the median is 27.5%." The research also found premiums in the ranges of 9.5% to 40.6%.

Corporate Finance Institute, 2022: "Typically, control premiums can be in the 20%-30% range of the target's current share price and can sometimes go up to 70%".

Loneragan, Wayne, 'The Valuation of Businesses, Shares and Other Equity': "A typical control premium may be in the order of 25% to ~~40%~~ 40%".

Halligan & Co, Control Premium Research: "The median takeover premium on the 20-day pre-bid price is 30% based on our analysis of 605 takeovers over 14 years to FY2014".

6.5 Valuation of Cape Flattery Silica Sand Project (CFSS)

Metallica Minerals operates the Cape Flattery Silica Sand Project which has been valued through a discounted cash flow method as per the Definitive Feasibility Study announced in November 2023. SRK was engaged to provide advice to us in respect of certain aspects of the Definitive Feasibility Study [DFS](#) (refer to Appendix A) for a description of work that SRK was engaged to undertake. SRK did not identify any significant risks associated with mining. SRK suggests that the key risks are associated with the metallurgical recovery, shipping and product price received. [Based on SRK's work, which indicated there was low risk in relation to operating costs and capital expenditure, we did not make any changes to the assumptions provided within the DFS cashflows.](#)

The Definitive Feasibility Study outlines 49.5Mt of mineral resources with 38.1Mt of Silica sand sales across a 25-year life of mine. The average 2025 sales price in real terms is AUD\$80.54 per tonne. [The life of mine revenue is forecast to be \\$3,064.6m.](#) The estimated initial construction capital expenditure is \$236.7m. [The life of mine revenue is forecast to be \\$3,064.6m.](#)

We were provided with the DCF used to value the project in the Definitive Feasibility Study, which involved a valuation of monthly cash flows adjusted for CPI. [We have made the following adjustments to the DCF to value the company on a nominal basis, we have excluded appropriately:](#)

- [Excluded the CPI impact and used these effect to value the project cash flows for valuation. We annualised.](#)
- [Annualised and mid-pointed the cash flows for timing purposes as projects may face changes in expected cash flows. We implemented a discount rate based upon the weighted average cost of capital \(WACC\) of 14.12% to 15.91% \(see Appendix C\), resulting in an estimated value of \\$153.98m to \\$194.76m for the Cape Flattery Silica Sand Project.](#)

Table 22: Value of Cape Flattery Silica Sand Project

- [The original DCF started in July 2025, as such, we have further discounted the cash flows to February 2024;](#)
- [Adjusted the discount rate based on the weighted average cost of capital \(WACC\) which can be seen in Appendix C.](#)

[As such, the cash flows that were used by AP to value this project were in nominal terms and were discounted with a nominal WACC.](#)

Assessed Level of Dilution:

[We note that the value of CFSS is based on the net present value of cash flows for the project and does not account for the risks and uncertainties regarding Metallica's ability to fund the initial construction capital expenditure.](#)

[The Definitive Feasibility Study estimated that the CFSS Project requires initial construction capex of \\$236.7m. Argonaut Capital were engaged by Metallica Minerals management team to assist in raising debt capital to fund the initial capex of the CFSS mine. Metallica received a term sheet offer for \\$100m at an interest rate of 12%. Metallica has not proceeded with the term sheet at this stage, however, the management team is undergoing discussions with this party, and various other debt providers to consider strategic options. To ensure commercial reality, AP has looked into the debt/equity mix of similar companies, which found that companies have similar capital structure and Metallica is aiming to raise a similar proportion of debt as the average.](#)

Table 22: Debt/Equity mix of similar companies

Company Name	Market Data		Capital Structure
	Market Cap	Value of Cape Flattery Silica Sand Project Enterprise Value	Debt/Capital

Astron Corporation Limited (ASX:ATR)	94.98	112.56	19.24%
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Atlas Lithium Corporation (NASDAQCM:ATLX)	330.21	NPV (14.32% WACC)	194,757,894.52.32%
NPV (15.91% WACC) GEO JS Tech Group Corp. (OTCPK:GJST)	153,978,174.13	NA	38.60%
Kachchh Minerals Limited (BSE:531778)	3.18	3.14	32.45%
Mineral Commodities Ltd (ASX:MRC)	22.64	33.01	16.08%
Strandline Resources Limited (ASX:STA)	138.94	327.06	57.84%

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<u>Min</u>	<u>1.13</u>	<u>3.14</u>	<u>16.08%</u>
<u>Average</u>	<u>98.51</u>	<u>159.18</u>	<u>36.09%</u>
<u>Median</u>	<u>58.81</u>	<u>112.56</u>	<u>35.53%</u>
<u>Max</u>	<u>330.21</u>	<u>327.06</u>	<u>57.84%</u>

There are a number of funding options that may be adopted by MLM. These may include:

- Share Issue – Metallica may opt to raise capital via a rights issue. However, due to the shares illiquidity and market cap of \$25m, this may be difficult to pursue. The company may be required to offer a discount to market to raise shares under this funding option.
- Joint Venture – The company may look to sell a portion of the CFSS Project to reduce funding requirements from MLM.

The level of dilution in MLM will be based upon the price at which the shares are raised. It is likely that shares would be issued in stages. Whilst it is not possible to predict the trading prices of Metallica, it is not unreasonable to assume that the share price would increase as shareholders gain confidence in the likelihood of successful funding of CFSS. As such, we believe that it is reasonable to assume the price offered on equity raises will increase as the company reaches milestones. We refer to the tables in Appendix G which outline the potential future dilution of Metallica shareholders to fund the CFSS Project. Based on our analysis in Appendix G, we consider it appropriate to discount the CFSS Project by 70% to account for risks and uncertainties regarding funding ability.

Table 23: Value of Cape Flattery Silica Sand Project

<u>Value of Cape Flattery Silica Sand Project</u>	
<u>High Value of CFSS (13.44% WACC)</u>	<u>212,651,502</u>
<u>Low Value of CFSS (14.08% WACC)</u>	<u>195,810,055</u>
<u>High Value of CFSS (70% Discount)</u>	<u>63,795,451</u>
<u>Low Value of CFSS (70% Discount)</u>	<u>58,743,016</u>

Source: AP Analysis

Table 24: Key Assumptions

<u>Assumption Parameter</u>	<u>Unit</u>	<u>Value</u>
<u>Silica Price</u>	<u>USD/t</u>	<u>47.5</u>
<u>Exchange Rate</u>	<u>AUD:USD</u>	<u>0.75</u>
<u>Opex</u>	<u>A\$/M</u>	<u>1,212</u>
<u>Capex</u>	<u>A\$/M</u>	<u>107</u>

Source: AP Analysis and Updated DFS for CFSS

The assumptions highlighted above were obtained from Metallica's updated DFS and were checked for reasonableness by SRK.

6.6 Sensitivity Analysis

The DCF valuation of Cape Flattery Silica Sand Project is based on numerous assumptions which are subject to uncertainty and variance. To provide a clearer understanding of our valuation to shareholders, we have completed a Sensitivity Analysis on the value of this project for both the high and low values.

The following variables have been adjusted in isolation, all other things held equal:

- A +/- 10% change in forecasted Silica Sand Price;
- A +/- 10% change in forecasted AUD:USD exchange rate;
- A +/- 10% change in Opex; and
- A +/- 10% change in Capex.

Users of this report must note that in reality, these variables above would have compounding and/or offsetting effects and are unlikely to move in isolation. These variables are not the only variables which are

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[subject to deviation from the assumptions AP has made. Furthermore, the sensitivities do not cover the full](#)

range of possible scenarios from the assumptions assumed, where variances can be greater or less than the percentage increase or decrease set out in this analysis.

The figures below highlight the impact of the variables on AP's valuation assessment of the Cape Flattery Silica Sand Project.

Figure 4: Sensitivity Analysis of Selected Key Assumptions for the DCF using WACC of 13.44%.

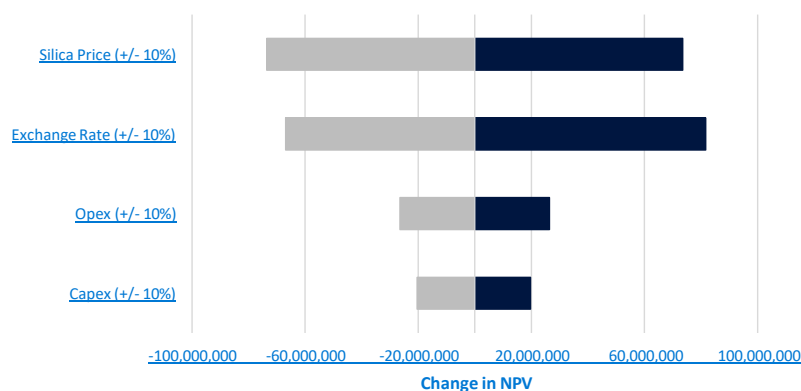
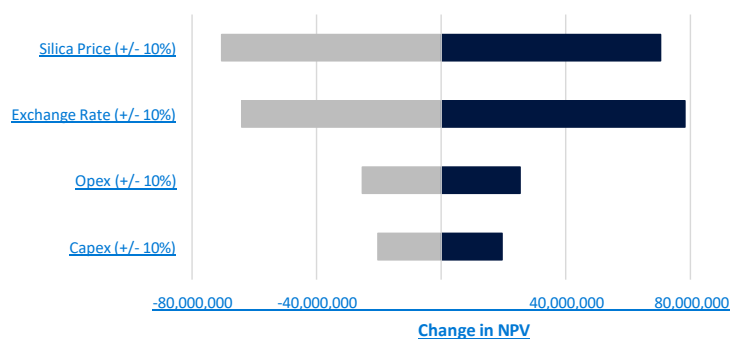


Figure 5: Sensitivity Analysis of Selected Key Assumptions for the DCF using WACC of 14.08%



6.7 VALMIN Disclosure

According to RG111.131, an expert is expected to have a VALMIN code report for valuing mining assets. However, RG 111.132 states that if this is not the case, it must be explained why this was not the case in the report. The reason AP was not able to obtain a VALMIN code report from an expert for valuing the mining assets was due to the limited timeframe provided to us. Although AP has attempted to engage various experts, the timeframe in which the report was to be prepared was too short, and hence limited our ability to obtain an expert's report which follows the VALMIN code.

Although a VALMIN report has not been prepared for the parties involved in this transaction, we believe that this report will assist security holders despite the limitations that AP cannot resolve. According to RG 111.126, the uncertainty is around the valuation methodology chosen to value projects that are not yet at

feasibility stage. AP has chosen to use a market based approach to these projects. The methodology chosen to screen these projects are further detailed in the report, and as such, we believe that the uncertainty would not have a significant impact on our opinion.

6.6.8 Valuation of Western Area of EPM 2574 at Cape Flattery

Metallica Minerals holds 12 Mt of Inferred Resources at the western end of the EPM 2574 which is not accounted for in the Definitive Feasibility Study and valuation. However, these resources have been measured as per reported in accordance with the JORC standards, as such, we've valued them based on an EV/Resource method using comparable silica sand mine multiples summarised below.

Table 2325: Metallica Minerals' Western Cape Flattery Valuation

Value of Western Cape Flattery	
Silica Sands (mt)	12
EV/R Multiple	0.46x
Value of Project	\$5.55m

Source: AP Analysis

We've valued the resources in western Cape Flattery to be \$5.55m based on the comparable companies listed in the table below:

Table 2426: Comparable companies summary

Company Name	Development Stage	Market Cap (AU\$m)	EV (AU\$m)	Total JORC Resource (Mt)	Implied EV/Resource
Diatreme	Scoping Study	74.60	63.30	605.16	0.46x
Industrial Minerals Ltd	Exploration	16.50	15.40	12.40	1.24x
VRX Silica Limited	Feasibility Study completed	58.34	57.20	1,380.50	0.04x
Min		16.50	15.40	12.40	0.04x
Average		49.81	45.30	666.02	0.46x
Median		58.34	57.20	605.16	0.46x
Max		74.60	63.30	1,380.50	1.24x

Source: AP Analysis

Source: AP Analysis

6.9 Valuation of Clermont Copper Gold Project

Metallica Minerals holds 51% of the Clermont Copper Gold Project with Diatrene holding 49%. The project does not have any JORC resources or reserves. We were able to identify a comparable transaction which was the sale of the Nullagine Gold Project in December 2023 to Calidus Resources Limited. The project was sold for \$250,000 plus a further payment of \$5,000,000 based on reaching certain production targets. The tenement area is 533 square kilometers.

The Clermont project is 252.36 square kilometers in the same region. Metallica has paid \$1,000,000 for its 51% of the project as part of its farm in arrangement with Diatrene. On a per square kilometer basis when comparing with the Nullagine Project it represents a comparable value for 100-% of the Clermont project of \$2.48M. We have valued the 51% of Clermont project at the amount Metallica has paid for the 51% being \$1,020,000.

6.76.10 Value of Metallica

We have reviewed the assets of the company in the following table including the reviewed valuation of the company's Cape Flattery Silica Sand Project. We have accounted for other mining resources, net cash, and a control premium to determine the fair value of MLM on a controlling basis of ~~\$213.6670.01~~ to ~~\$266.67.75.06~~.

Table 2527: Metallica Minerals' Valuation Summary

Fair Value of MLM	Low	High
NPV of CFSS Project	153.98 58.74	194.7 663.80
Other Mining Western Cape Flattery Resources	5.5542	5.5542
Clermont Project (51%)	1.02	1.02
Net Cash	4.82	4.82
Equity Value of MLM	164.35 70.01	205.1 375.06
Control Premium	30%	30%
Equity Value (Control Premium)	213.66	266.67

Source: AP Analysis

Source: AP Analysis

This represents a per share value below:

Table 2628: Metallica Minerals' Valuation on Controlling Basis

Fair Value of MLM on a minority basis	Low	High
Fair value of MLM (incl. controlling premium)	213.66 70.01	266.67 75.06
Shares Outstanding (incl. options)	959991.92	959991.92
Fair Value of MLM shares on a controlling basis	0.223071	0.278076

Source: AP Analysis

Source: AP Analysis

We have assessed the value of MLM based on the sum of parts method to be in the range of \$0.~~223071~~ to ~~\$0.278~~. This valuation is higher than the VWAP of MLM of \$0.0225 leading up to the takeover announcement. Our valuation may differ to the market due to the potential future capital raises to fund the Cape Flattery Silica Sand Project. These capital raises may dilute existing shareholders through the issuance of ordinary shares. The current shareholders of Metallica may discount the value of the stock on this basis. We have, however, considered a range of dilution scenarios and adjusted the value of the CFSS Project accordingly as per Section 6.5.

6.86.11 Share Valuation Cross Check

We have considered multiple valuation methodologies in assessing the value of Metallica Minerals. In this analysis, we have provided reasons why we have not proceeded with the following:

- Quoted Market Price – We have deemed this method as inappropriate due to the illiquidity of Metallica Mineral shares based on the analysis in section 5.10.
- Market Based Valuation – We have partially utilised a market-based valuation using EV/Resources in our primary valuation. Additionally, the valuation of CFSS on an EV/Resource basis would undervalue the resources considering the project has a Definitive Feasibility Study.
- Capitalisation of Future Maintainable Earnings – We have not adopted this valuation method as Metallica does not produce positive earnings.

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We have considered all available valuation methods and have concluded that the most appropriate cross-check method is based on Metallica Minerals most recent capital raising in FY23. The company's capital raising history is detailed in section 5.12 of this report. The latest capital raising includes 145,000,000 shares at \$0.035 totaling \$5,075,000 in funds raised.

Table 2729: Metallica Minerals' Valuation Cross Check

Fair Value of MLM on a minority basis (cross-check)	Deleted Cells
Capital Raise Price of MLM	0.035
Shares Outstanding	959,92
Fair Value of MLM	33.6032.16
Control Premium	30%
Fair Value of MLM on a controlling basis	43.67741.805

Source: AP Analysis
Source: AP Analysis

We have assessed the value of Metallica Minerals based on ~~their~~ the VWAP of the November 2022 capital raising at \$0.~~0350335~~ per share. Based on this valuation method, the fair value of MLM on a controlling basis is \$~~43.677m. However, it should be noted~~ 41.805m. We note there is a significant discount between the cross-check and the primary valuation and have provided reasoning to this discount:

- The placement was pre-feasibility and did not reflect the economic viability of the CFSS resources.
- Shareholders may differ in opinion regarding the debt and equity mix required to fund the CFSS Project, particularly given there was no estimate of initial capex to fund the project as provided by the DFS.

6.12 Difference to Market Price

According to RG 111.82, an Independent Expert is required to comment on the material difference between the market share price and the expert's valuation. In AP's opinion, the following reasons explain the reason for this material difference:

- Metallica is a thinly traded stock: According to RG 111.86, there are certain methodologies considered appropriate. RG 111.86(d) discusses the quoted price for listed securities when there is a liquid and active market as an appropriate methodology. As Metallica's shares do not meet this criterion, AP believes that this capital is a possible description for the material difference in valuation.
- As the company is thinly traded it is likely that there is a liquidity discount on the current share price
- There is a control premium implicit in the valuation methodology which isn't reflected in the market price.
- In the CFS region, Metallica's project is the most developed after Mitsubishi, which gives the company a first mover advantage and is not yet realised by the market.
- The company had not disclosed its fund raising ~~was prior to Metallica's Definitive Feasibility Study~~ endeavors and as a result may not represent have been discounted due the fair market not having this information.
- As a small cap company there is low share market visibility and not many investors are aware of Metallica due to its operations within a niche market. Market value ~~of those resources~~ reflects supply and demand in the current market and related market sentiment with regard to the future prospects of the company. The company is a small market cap company so limited coverage leading to limited investor attention

Table 30: Valuation to Share Price

Percentage to Share Price - Share Price Day before Offer	Low	High
Metallica Percentage to Share Price	173%	292%
Diatreme Percentage to Share Price	100%	152%

Source: AP Analysis

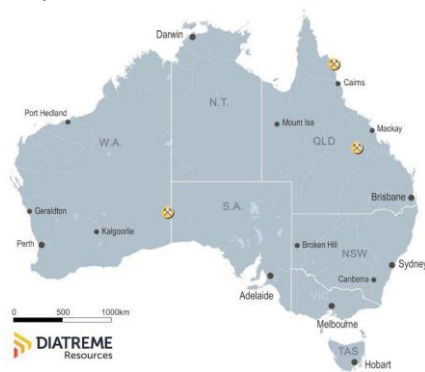
7.0 Diatreme Resources Ltd

7.1 Company overview

Diatreme Resources Limited is an emerging Australian producer of mineral and silica sand based in Brisbane. The company has four key projects, with two ~~foeussed~~[focused](#) on silica sand. Diatreme also has a Copper-Gold Project, which is subject to a farm-out with Metallica Minerals (ASX: MLM). The company also has a Zircon-rich project, which is considered one of a handful of major zircon-rich discoveries in the past decade. This project is well-positioned for development, sale, or joint venture.

Diatreme has an experienced Board and management across all stages of exploration, mine development and financing coupled with strong community engagement skills. The company has resources which play a role in the global decarbonisation and ongoing conversion of power generation to renewable energy sources. Further, the company has a strong focus on ESG, working with Traditional Owners to ensure long-term sustainability including health, safer and environmental stewardship.

Figure 46: Map of Diatreme's Operations



Source: Diatreme Annual Report

~~Source: Diatreme Annual Report~~

7.2 Projects

The table below highlights the key projects and their descriptions.

Table 2831: Diatreme Projects Summary

Project	Description	Stage of Development
Northern Silica	Diatreme Resources' Northern Silica Project is a silica sand mining project in early stages. The site is situated in the Hope Vale Aboriginal Shire near Cape Flattery, Far North Queensland and in close proximity to the Cape Flattery Silica Mines and the Cape Flattery Port.	Exploration Stage: Completed a Scoping Study. Has not completed a Pre-Feasibility Study (PFS) or a Definitive Feasibility Study (DFS). The Scoping Study has provided Indicated and Inferred Resources and does not provide Inferred Resources and does not provide probable or proven ores in their JORC summary.
Galalar	The Galalar project is located near the world's largest silica sand mine in North Queensland. Diatreme's Galalar Silica Project is capable of producing high quality silica for the Asian solar panel market.	Exploration Stage: A DFS was in process until the Northern Silica Project was identified and developed. This project has now been paused until the company's Northern Silica Project is until the company's Northern Silica Project is further developed.
Cyclone	Diatreme's Cyclone Zircon Project in Western Australia's Eucla Basin is considered the largest undeveloped high-grade zircon project in the Basin	Early Development: Completed a DFS, and Diatreme is looking to raise capital through development partners for this project.

Clermont	The Clermont Copper/Gold Project is situated in the town of Clermont in central Queensland. The project is prospective for porphyry and stratabound <u>strata bound</u> bulk tonnage copper/gold deposits along with mesothermal gold deposits.	Exploration: Drilling programs results were released, with JV partner (Metallica Minerals) now owning a 51% ownership of this project. Further drilling programs are expected to continue.
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Source: AP Analysis

The Northern Silica Project and Galalar Project are owned by Cape Silica Holdings Pty Ltd, in which Diatreme has entered into a joint venture with their second largest shareholder, Sibelco. Diatreme currently has a 73.2% share in Cape Silica Holdings Pty Ltd.

Advisory Partner has concluded that some of Diatreme's projects would be inappropriate to consider in the valuation of Diatreme's shares. The following table highlights the reasoning as to why this is the case.

Table 29: Diatreme's Projects discounted from valuation

Project	Reason
Galalar	This project was not considered in the valuation of Diatreme's shares as it is currently not being developed and has been stopped in its production as a result of DRX's focus on developing the Northern Silica Project. The project is planning to develop a slurry pipeline to the port of Cape Flattery as the main option of exporting silica sand. This constitutes approximately 30km of pipeline infrastructure that is required to cross some rivers and traditional land, subject to various regulatory approval. Moreover, in July 2023, Diatreme Resources formally withdrew its application to prepare an EIS for this project.
Clermont	Clermont was not considered in the valuation of Diatreme's shares as JORC Mineral Resources are yet to be identified. As such, there would be no reliable way of valuing this project because no certainty can be placed on the project's cashflow.

Although the Galalar Project has probable reserves, Diatreme has publicly announced that their efforts were to focus on developing the Northern Silica Project and therefore, have stopped developing the Galalar project. Moreover, in July 2023, Diatreme formally withdrew its application to prepare an EIS for Galalar.

Source: AP Analysis

7.3 Diatreme Resources JORC Ore Reserves and Mineral Resources

Diatreme's Ore Reserves and Mineral Resources are summarised below in accordance with the JORC (2012) Code.

Table 30: Summary of Heavy Minerals (HM) Ore Reserves and Mineral Resources

Project	Ore Reserve Category	Ore Tonnes Millions	In-situ HM Tonnes Millions	HM Grade (%)
Cyclone	Probable	138	2.52	2.00
Project	Mineral Resource Category	Mineral Tonnes Millions	In-situ HM Tonnes Millions	HM Grade (%)
Cyclone	Measured	156	2.81	2.40
	Indicated	48	0.89	1.90
	Total	203	4.70	2.30

Source: AP Analysis and Diatreme's 2023 Annual Report

Table 31: Summary of Silica Sand Ore Reserves and Mineral Resources

Project	Ore Reserve Category	Ore Tonnes Millions	SiO2 Grade %
Galalar	Probable	32.53	99.2
Project	Mineral Resource Category	Material Tonnes Millions	SiO2 Grade %
	Measured	43.12	99.21
	Indicated	23.12	99.16
Galalar	Inferred	9.22	99.10

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	Total	75.46	99.18
NSP	Measured	49.5	99.33
	Indicated	120.50	99.31
	Inferred	65.00	99.27
	Total	235.00	99.29
WRA	Indicated	10.3	99.2

		ADVISORY  PARTNER	
		DELIVERING CLARITY	
	Inferred	81.4	99.38
	Total	91.7	99.36
Total	Measured	92.62	99.21
	Indicated	153.92	99.16
	Inferred	155.62	99.31
	Total	402.16	99.26

Source: AP Analysis and Diatreme Annual Report

As can be seen from the JORC tables, only two of Diatreme's projects, Cyclone and Galalar have reserves.-
Diatreme's Northern Silica only has mineral resources and Clermont is in the early drilling stage and there ~~has not been~~
~~any identification of Mineral Resources according to the JORC Code.~~

[has not been any identification of Mineral Resources according to the JORC Code.](#)

7.4 Key ~~personnel~~Personnel

The Executives and Directors of Diatreme are detailed in the table below.

Table 3233: Executives of Diatreme Resources Limited

Name & Position	Description
Neil John McIntyre Chief Executive Officer	Neil J. McIntyre has led Diatreme Resources Limited as CEO since August 26, 2014, bringing over 25 years of senior management experience. Formerly Managing Director of Pacific Capital Limited, his expertise in mining and petroleum sectors, coupled with roles in origination and financing, solidifies his prominence in the industry. McIntyre's contributions extend to various listed and unlisted exploration companies.
Tuan Quy Do CFO, Financial Controller & Company Secretary	Tuan Quy Do, BComm., CA, has been the Company Secretary of Diatreme Resources Limited since May 26, 2011, concurrently holding the positions of Financial Controller and Chief Financial Officer. With over 20 years of experience in senior finance roles for public companies in Australia and New Zealand, Mr. Do's expertise contributes significantly to the company's financial management.
Neil MacKenzie-Forbes Chief Geologist	Mr. Neil Mackenzie-Forbes serves as a Chief Geologist at Diatreme Resources Limited. He served as a General Manager of Columboola Joint Venture of Metrocoal Ltd., from December 14, 2011 to September 30, 2013. Mr. Mackenzie-Forbes served as an Exploration Manager of Metrocoal Ltd. from July 1, 2008 to December 14, 2011. Mr. Mackenzie-Forbes graduated from the Queensland University of Technology with a Bachelor of Applied Science in 1993.
Wayne Swan Chairman of the Board	Wayne Swan, BA Hons, is the Independent Non-Executive Director & Chairman of Diatreme Resources Limited since November 2021. Formerly Australia's Treasurer, he received the Euromoney Finance Minister of the Year award in 2011 and is actively involved in international commissions on inclusive prosperity and corporate taxation. Swan is also the President of the Australian Labor Party.
Michael John "Mike" Chapman Director	Michael John Chapman, also known as Mike, is an Independent Non-Executive Director at White Energy Company Limited since June 01, 2023, and a Non-Executive Director of Diatreme Resources Limited since August 1, 2020. He previously served as Chief Operating Officer at White Energy Company Limited from July 19, 2010, to August 31, 2019, and held a similar role at Yancoal Resources Limited from July 1, 2007. With expertise in the development and management of mining projects, Mr. Chapman brings valuable experience to his roles.
Kara Keys Director	Ms. Kara Keys joined Diatreme Resources Limited as a Non-Executive Director on July 19, 2023, bringing a robust background in finance and board leadership. With prior roles at Cbus Super, Powerlink, and United Super Asset Management, she has a strong financial foundation. Additionally, Ms. Keys has been actively involved in advocacy, serving as the chair of Women in Super and contributing to Indigenous communities through her work at the Australian Council of Trade Unions.

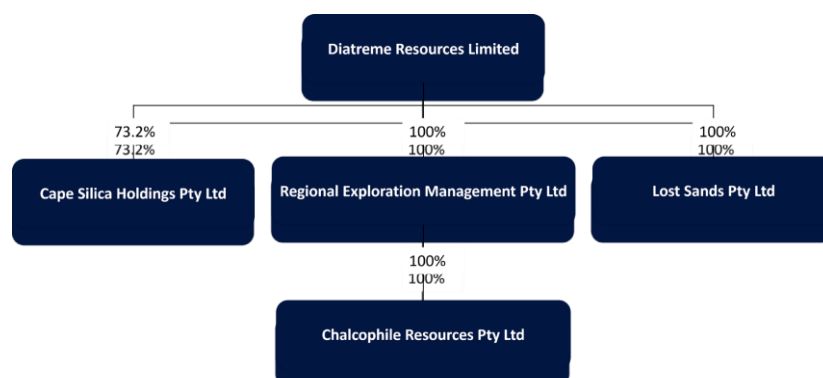
Gregory Barry Starr Director	Mr. Gregory Barry Starr, known as Greg, holds key positions in the corporate sector. Serving as Managing Director, Company Secretary, and CFO of AHP Group Limited, he has directed Candy Club Holdings Limited and serves as Company Secretary at Investor Centre Limited. With executive roles at KBL Mining Limited and memberships in the Australian Institute of Company Directors, he brings extensive experience to various ASX-listed companies, including Admiralty Resources NL and Smart Auto Australia Limited.
Cheng "William" Wang Director	Mr. Cheng Wang, also known as William, is the Director of Investment Banking at AIMS Financial Group and a founding Director of Gulf Alumina Pty. Ltd. With senior management experience in major Chinese state-owned companies like China Poly Group, he has significant business connections in China. Serving as a Non-Executive Director of Diatreme Resources Limited since May 27, 2011, Mr. Wang holds an MBA in finance from the Chinese University of Hong Kong.

Source: Capital IQ

7.5 Ownership and Capital Structure

Diatreme has the following subsidiaries:

Figure 17: Diatreme's Corporate Structure



Source: Capital IQ and AP Analysis

Note: Sibelco has recently completed two tranche investments with Cape Silica Holdings Pty Ltd, yielding a 26.8% Joint Venture. This means that the projects held under Cape Silica Holdings result in 73.2% attributable to Diatreme Resources.

As at 31st of December 2023, Diatreme Resources' top 10 shareholders and total issued ordinary shares are summarised in the table below.

Table 3335: Top 10 Shareholders as at 31st of December 2023

As of 31st December 2023			
Pre-Takeover DRX Shareholder Name	Number of Ordinary Shares Held	Percentage Held of Issued Ordinary Capital	
Ilwella Pty. Ltd.	784,677,120	21.04%	
SCR-Sibelco N.V.	742,513,428	19.91%	
DELPHI Unternehmensberatung AG	341,307,138	9.15%	
Yufeng Zhuang	151,841,819	4.07%	
Zinvest AG	130,434,783	3.50%	

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Chenfei Zhuang	91,900,000	2.46%
Jie Wu	87,171,308	2.34%
Chenxia Zhou	62,500,000	1.68%
VW Pty Ltd	61,000,001	1.64%
Andrew Tsang	53,177,747	1.43%
Top 10 Shareholders	2,506,523,344	67.20%
Other Shareholders	1,223,235,782	32.80%
Total Issued Shares	3,729,759,126	100.00%
Outstanding Options & Performance Rights	66,666,667	
Total Diluted Shares	3,796,425,793	

Source: Capital IQ and AP Analysis

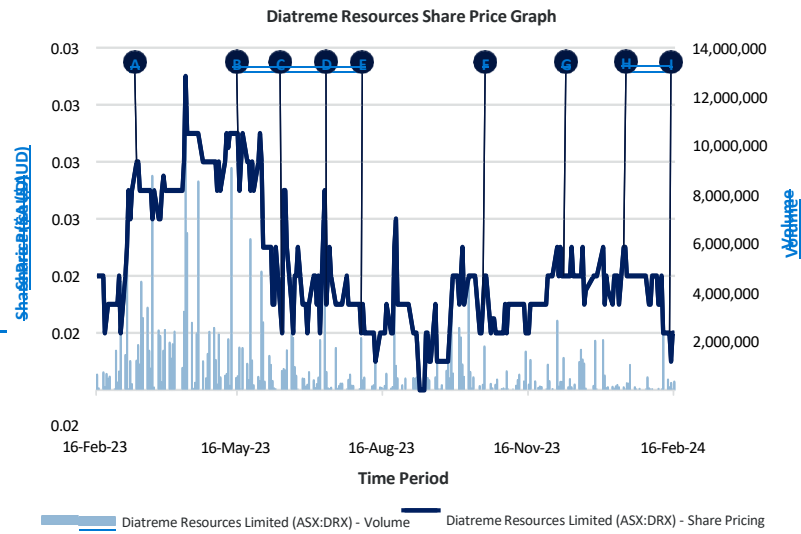
7.6 Share Price Analysis

In order to assess the reliability of using the traded market price of DRX's shares as a basis for determining the fair market value of the shares in DRX we have had regard to:

- the liquidity of the stock over the trading period;
- the 'spread' of ordinary shareholders and the total number of ordinary shares that they hold in the Company, considering any trading or other restrictions applicable to the quoted ordinary shares;
- the level of trading activity of the quoted ordinary shares in the Company (i.e. the volume of trades of the quoted ordinary shares in the market as a percentage of the total quoted ordinary shares, and the frequency of the trades);
- the number and frequency of 'unusual' and/or 'abnormal' trading that takes place in the Company's ~~quoted ordinary shares;~~
quoted ordinary shares;
- the presence of any factors that may indicate that trading in the shares is the result of significant speculative trading; and
- the level of knowledge that the 'willing' buyers and sellers have in respect of the Company and the market in which it operates.

We have analysed Diatreme's daily share close price and volume traded during the period from 16th of February 2023 to 16th of February 2024.

Figure 58: Diatreme Share Price Analysis



Source: Capital IQ and AP Analysis

Notable events disclosed by Diatreme's company announcements during the trading period which may have impacted Diatreme's share price movements and trading volumes are set out as follows:

Table 3436: Diatreme's Recent Company Announcements

Date	Event	Description
13-Mar-23	A	Major Silica Resource Expansion
19-May-23	B	Permitting Pathway advances for NSP
14-Jun-23	C	Scoping Study for NSP
13-Jul-23	D	Offtake MOU for NSP
03-Aug-23	E	NSP granted Regional Significance Status
17-Oct-23	F	Sibelco 2nd Tranche Investment
06-Dec-23	G	Resources found near NSP
15-Jan-24	H	Diatreme NSP declared a Coordinated Project
16-Feb-24	I	Conditional intention to make a takeover bid for MLM

Source: Capital IQ

The following tables outline Diatreme's trading data. The past 12-months of trading data was used to determine daily turnover and monthly volumes. Typically, the large sophisticated and founding shareholders of small-cap companies are not traders of their shares.

Table 3537: Diatreme's Share Overview

Company	Ticker	Shares Outstanding	Free Float
Diatreme Resources Limited	ASX:DRX	3,729,759,126	1,125,940,493

Source: Capital IQ

The following table is a summary of Diatreme's 12-month trading data including average daily volume, low price, high price, and closing price.

Table 2638: Diatreme's Trading Data

ASX:DRX	Avg Volume	Low (\$AUD)	Share Pricing High (\$AUD)	Close (\$AUD)
Month Ended				
Mar-23	2,189,076	0.022	0.028	0.027
Apr-23	2,904,536	0.027	0.031	0.028
May-23	1,672,351	0.027	0.029	0.028
Jun-23	850,125	0.022	0.027	0.023
Jul-23	606,599	0.022	0.027	0.023
Aug-23	618,056	0.021	0.026	0.023
Sep-23	692,890	0.020	0.024	0.024
Oct-23	895,300	0.022	0.025	0.022
Nov-23	405,804	0.022	0.024	0.024
Dec-23	686,438	0.023	0.025	0.024
Jan-24	284,285	0.023	0.025	0.023
Feb-24	514,326	0.021	0.024	0.023

Source: Capital IQ & AP Analysis

Given the above data, we note the following regarding DRX's trading data:

- the share price peaked at \$0.031 in April 2023 and reached a low of \$0.020 in September 2023.
- average daily volumes ranged from 284,285 in January 2024 to 2,904,536 in April 2023.

7.7 Liquidity Analysis

The following table displays the volume for each month in the past year, as well as the percentage of total and free float shares for each given month.

Table 2739: Diatreme's Liquidity Analysis

Month	Volume Traded	Vol. Traded as % of Total Shares	Vol. Traded as % of Free Float Shares
Feb-24	9,990,525	0.27%	0.89%
Jan-24	11,768,841	0.32%	1.05%

Dec-23	14,822,520	0.40%	1.32%
Nov-23	10,075,778	0.27%	0.89%
Oct-23	18,529,025	0.50%	1.65%
Sep-23	20,032,470	0.54%	1.78%
Aug-23	16,435,796	0.44%	1.46%
Jul-23	16,979,237	0.46%	1.51%
Jun-23	24,234,727	0.65%	2.15%
May-23	45,694,710	1.23%	4.06%
Apr-23	70,653,845	1.89%	6.28%
Mar-23	61,046,491	1.64%	5.42%
Minimum	9,990,525	0.27%	0.89%
Average	26,688,664	0.72%	2.37%
Median	17,754,131	0.48%	1.58%
Maximum	70,653,845	1.89%	6.28%

Source: Capital IQ and AP Analysis

We note the following regarding DRX's volume and liquidity data from March 2023 to Feb 2024:

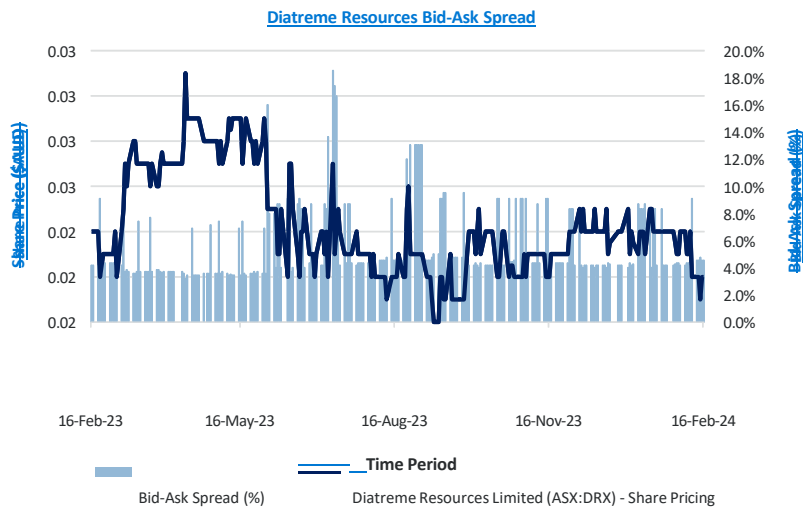
- the cumulative volume traded of total shares is 8.6% over this period.
- the cumulative volume traded of free float shares is 28.4%.
- monthly volumes ranged from 9,990,525 in February 2024 to 70,653,845 in April 2023.

In accordance with RG 111.86(d), an expert can use the quoted price for a listed security as an appropriate method of valuation, when there is a liquid and active market. Since Advisory Partner identified that less than 10% of trading volume occurred each month over the past year, this method is not considered appropriate.

We have analysed the bid and ask spread in trading data for the previous 12-months. The below chart demonstrates the bid and ask spread from 16th of February 2023 to 16th of February 2024.

Figure 69: Diatreme Bid/Ask Spread

Diatreme Resources Bid-Ask Spread



Source: Capital IQ and AP Analysis

In regard to the data provided above, we note the following:

- the minimum spread is 3.23%
- the median spread is 4.35%

- the average spread is 5.61%
- the maximum spread is 18.52%

For a stock to be thinly traded, the stock must have a low volume of trades and also a large bid-ask spread. However, the spread percentage was minimal as the share price difference between the bid and ask prices was one-thousandth of a cent. Therefore, from our analysis, we have determined that Diatreme's shares are thinly traded. As such, we have not used the share price as our primary valuation method.

7.8 Volume Weighted Average Price

We have reviewed the following factors relating to the trading activity of Diatreme's shares on the ASX:

- the daily high, low and closing share price of trades of Diatreme;
- the daily volume of DRX's share trading; and
- the volume weighted average share price ("VWAP") of DRX.

Table 3.340: Diatreme's VWAP

Diatreme VWAP	Low	High	VWAP
Up to 16th February 2024			
1 Day	0.0200	0.0310	0.0220
5 Day	0.0211	0.0303	0.0222
10 Day	0.0214	0.0297	0.0223
1 Month	0.0217	0.0293	0.0229
2 Month	0.0227	0.0287	0.0237
3 Month	0.0229	0.0280	0.0238

Source: Capital IQ & AP Analysis

We note the following regarding with respect to the share price of MLM in the 3-months leading up to the takeover intention announcement.

- The VWAP ranges from \$0.0220 (1-day) to \$0.0238 (3-month)
- The average VWAP across this range is \$0.0228.
- From Advisory Partner's analysis, Diatreme's VWAP has been trading below Metallica's VWAP.

7.9 Historical Profit and Loss

We detail below the past 3 years Profit and Loss for Diatreme.

Table 3941: Diatreme's Historical Profit and Loss

Income Statement ('000's)	Actual		
	CY21	CY22	CY23
Revenue	24	110	456
Other Income	-	8,282	13,848
Total Income	24	8,392	14,304
Expenses			
Employee Benefits	(858)	(1,204)	(1,164)
Exploration expenditure written off	(17)	-	(21)
Share based payment expense	(199)	(339)	(458)
Other Expenses	(887)	(1,578)	(1,951)
Total Expenses	(1,962)	(3,121)	(3,594)
EBITDA	(1,938)	5,271	10,710
Depreciation Expense	(101)	(171)	(214)
EBIT	(2,039)	5,099	10,496
Interest	(111)	(121)	(130)
Pre Tax Income	(2,150)	4,978	10,366
Income Tax	-	-	-
Net Profit	(2,150)	4,978	10,366

Source: Diatreme Annual Reports

7.10 Historical Balance Sheet

We detail below the historical balance sheet for Diatreme as at 31 December 2020, 2021 and 2023.

Table 4942: Diatreme's Historical and Current Balance Sheet

Balance Sheet ('000's)	Actual		
	CY21	CY22	CY23
ASSETS			
Current Assets			
Cash and Cash Equivalents	6,500	13,641	10,772
Trade and Other Receivables	161	563	314
Total Current Assets	6,662	14,204	11,086
Non-Current Assets			
Investment in joint venture	-	25,117	38,948
Property, Plant and Equipment	254	581	694
Right-of-use Assets	88	29	216
Exploration and evaluation of assets	26,095	15,364	15,540
Other Assets	38	38	47
Total Non-Current Assets	26,474	41,130	55,446
Total Assets	33,136	55,334	66,532
LIABILITIES			
Current Liabilities			
Trade and Other Payables	713	967	1,044

Borrowings	1,518	-	1,525
Lease Liabilities	58	32	96
Provisions	8	9	103
Total Current Liabilities	2,297	1,008	2,768
Non-Current Liabilities			
Borrowings	-	1,509	-
Lease Liabilities	32	-	125
Provisions	46	70	68
Total Non-Current Liabilities	78	1,580	193
Total Liabilities	2,375	2,588	2,961
Net Assets	30,761	52,746	63,571
Equity			
Issued Capital	76,965	93,638	93,638
Reserves	225	559	1,017
Accumulated Losses	(46,429)	(41,450)	(31,084)
Total Equity	30,761	52,746	63,571

Source: Diatreme Annual Reports

7.11 Historical Cash Flow Statement

We detail below the historical Cash Flow Statement for Diatreme as at 31 December 2020, 2021 and 2022.

Table 4143: Diatreme Historical Cash Flow Statement

Cash Flow Statement ('000's)	CY21	Actual CY22	CY23
Cash from Operating Activities			
Receipts in course of operations	15	17	8
Payments to suppliers and employees	(1,978)	(2,427)	(2,645)
Interest received	9	26	420
Government grants & Incentives	-	-	-
Finance Costs	(193)	(124)	(103)
Net Cash from Operating Activities	(2,147)	(2,508)	(2,320)
Cash From Investing Activities			
Payments for Property, Plant and Equipment	(203)	(480)	(290)
Payments for Exploration and Evaluation assets	(6,349)	(6,583)	(194)
Proceeds from sale of Property, Plant and Equipment	-	108	30
Proceeds from sale of investments	-	-	-
Payments for security deposits	(18)	-	(9)
Net Cash used by Investing Activities	(6,569)	(6,955)	(462)
Cash From Financing Activities			
Proceeds from issue of shares	10,130	17,756	-
Payments for share issue costs	(639)	(1,089)	-
Repayment of Lease Liabilities	(62)	(63)	(86)
Net Cash from Financing Activities	9,429	16,604	(86)
Net Increase / (Decrease) in cash & cash equiv.	712	7,141	(2,868)
Cash and Cash equiv. at beginning of year	5,788	6,500	13,641
Cash and Cash equiv. at end of year	6,500	13,641	10,772

Source: Diatreme Annual Reports

8.0 Valuation of Diatreme's Shares

To arrive at an appropriate valuation of Diatreme's Shares, we have considered various methods as set out in Appendix 2. From our analysis, the most appropriate valuation method applicable is the EV/Resources multiple.

We have based our assessment of EV/Resources on:

- Summary of Diatreme Resources proposed Northern Silica Project Report by Cowie Environmental Services ([Appendix E](#));
- An infrastructure review commissioned by Advisory Partner done by PAEMAC (Appendix D);
- Previous audited annual reports;
- Diatreme's Scoping Study for Northern Silica Project; and
- Any other publicly available information regarding Diatreme's projects.

8.1 Scoping Study

On 14 June 2023, Diatreme announced a 'Positive Scoping Study for Northern Silica Project' which highlighted the proposed operations of the overall Northern Silica Project. Diatreme completed this study with assistance from Ausrocks. In this study, Diatreme estimates a mine life of 25 years with a target production rate of 3Mtpa in the first two years and moving to 5 Mtpa in Phase 2. The study highlights the viability of producing and exporting Silica Sand. The Scoping Study states that it is based on 100% ownership of Cape Silica Holdings Pty Ltd, however this is not the case. Sibelco, Diatreme's second largest shareholder also entered into a joint venture of 26.8%, which implies that Diatreme's ownership of the Northern Silica Project and the Galalar project is 73.2%. This has been accounted for in Advisory Partner's valuation of Diatreme's shares. Furthermore, the Northern Silica Project has no reserves, and only JORC Resources have been identified. NSP's JORC Resources are categorised as Indicated and Inferred, suggesting a lower level of geological knowledge and confidence and does not consider any Modifying Factors.

8.2 Infrastructure

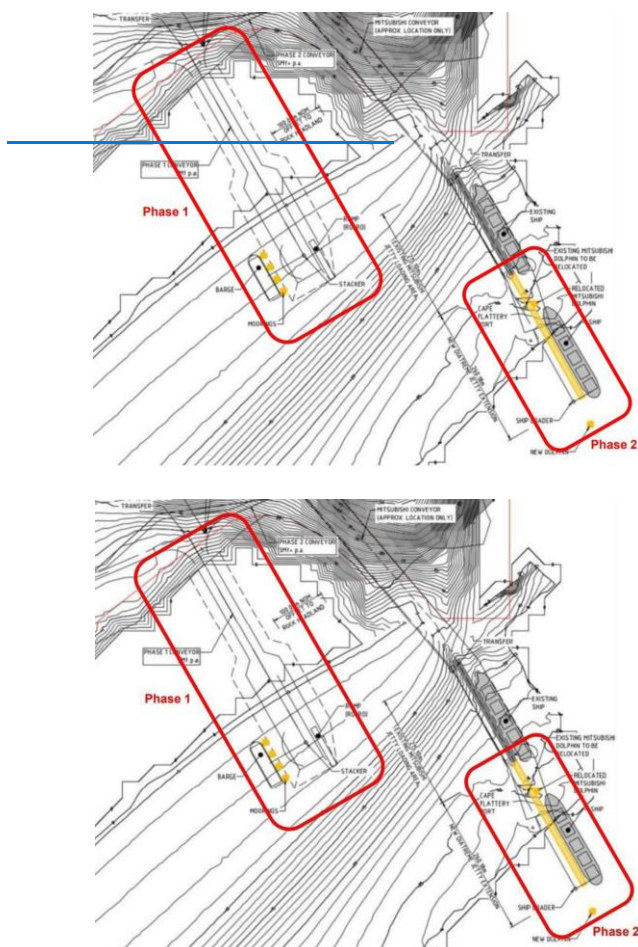
At present, Diatreme's mining and exploration area does not have any infrastructure they can use to generate cash flow. The scoping study highlights key details of the port and site infrastructure that requires development.

Port Infrastructure

To export the material, Diatreme has identified that Ports North Cape Flattery is the most economically viable method. The study highlights two development phases, where Phase 1 involves the construction of a rock wharf to the west of Mitsubishi's existing jetty that is equipped with a conveyor and shiploader system outloading onto 8,500t ~~transshipment~~ [transshipment](#) barges with an outloading capacity of 3Mtpa. Diatreme's rock wharf is expected to include a concrete roll on-roll off facility.

Phase 2 is an extension of Mitsubishi's jetty to allow for 55,000t bulk carriers to moor directly onto the jetty and be loaded by shiploader. Diatreme expects this to have an outloading capacity of 5 Mtpa. The wharf extension is to be constructed 3 years after the construction of the rock wharf. The figure below outlines the planned infrastructure.

Figure 7.10: Diatreme's Port Infrastructure Proposal



Source: PAEMAC's Port Infrastructure Report

According to the PAEMAC Report (Appendix D), there are various site constraints during the construction process for the port infrastructure. These include road access, water depth, tidal range, and adverse weather conditions such as Cyclones. These are further explained in the table below.

Table 4244: Port Infrastructure Constraints

Constraint	Explanation
Access	Road access to the site is limited to a 4x4 track. It is expected that all material delivery will be through water, with marine plant being mobilised from Cairns or Townsville. Land-side plant for construction of the rock wharf will also need to be mobilised via water and a temporary facility will need to be constructed for the delivery of earthmoving equipment.
Water Depth	Depth at outermost tip of rock wharf is 8m at Lowest Astronomical Tide (LAT)
Tidal Range	Maximum tidal range is 3m, with 95% daily variation falling between 0.34m and 2.57m above LAT

Cyclone and
Weather

The site is located in the Eastern Cyclone Zone, with Cyclones typically running from November to April. Provision of Cyclone moorings for all marine construction plant on site would be required. Further, previous project experience under these conditions suggest a 15% weather loss to be expected.

Source: PAEMAC's Port Infrastructure Report

To facilitate the construction of Diatreme's wharf extension during Phase 2, the existing mooring dolphin which assists Mitsubishi's current operations will need to be relocated in order to not disturb their operations. However, due to the location of Diatreme's wharf extension, the new dolphin will still be impacted by shipping operations. This will require the periodic relocation of the Self-Elevating Modular Platform (SEMP) to accommodate the passage of vessels for Mitsubishi's operations.

According to PAEMAC's estimate, the overall estimate for the cost of constructing Diatreme's proposed rock wharf is \$160.3 million while Phase 2 wharf construction is estimated to cost \$236.2 million. These estimates include direct costs, indirect costs, and any contingency provisions. These PAEMAC estimates of the marine infrastructure capital total \$396.5m which is significantly higher than the estimated capital costs disclosed in Diatreme's Scoping Study for Off Site Infrastructure, being \$175.9m. The PAEMAC Report is detailed in Appendix D.

PAEMAC's report also highlights some key interaction issues with the existing port infrastructure and CFSM Operations. Due to Mitsubishi's operations existing in close proximity, interaction issues are unavoidable and involve the risks detailed in the table below.

[Table 45: Port Infrastructure Interaction Issues](#)

[Table 43: Port Infrastructure Interaction Issues](#)

Interaction Issues	Explanation
Phase 1 transshipping transshipping	Key risks include interaction/coordination with existing operations and management of shipping operations, operational capacity of transshipping transshipping vessels and rate of outloading operations, weather, and capacity of existing dolphins to accommodate simultaneous mooring of bulk- and transshipment transshipment- vessels.
Phase 2 Construction	The existing Port of Cape Flattery approach and lack of tugs available means construction area of Phase 2 extension is in the path of incoming vessels. This would mean that all construction activities would need to be coordinated with shipping schedule.
Port Operations post Phase 2 construction	Due to the proximity of both berths, a re-evaluation of current port approach and mooring strategy is required.
Removal/Relocation of Existing Mooring Dolphin	The current existing dolphin is in the path of the construction area and will need to be relocated during the construction phase to reduce impact on current operations.
Safety Issues for Workers	Some key workplace safety considerations include any parting mooring lines that may snap-back.

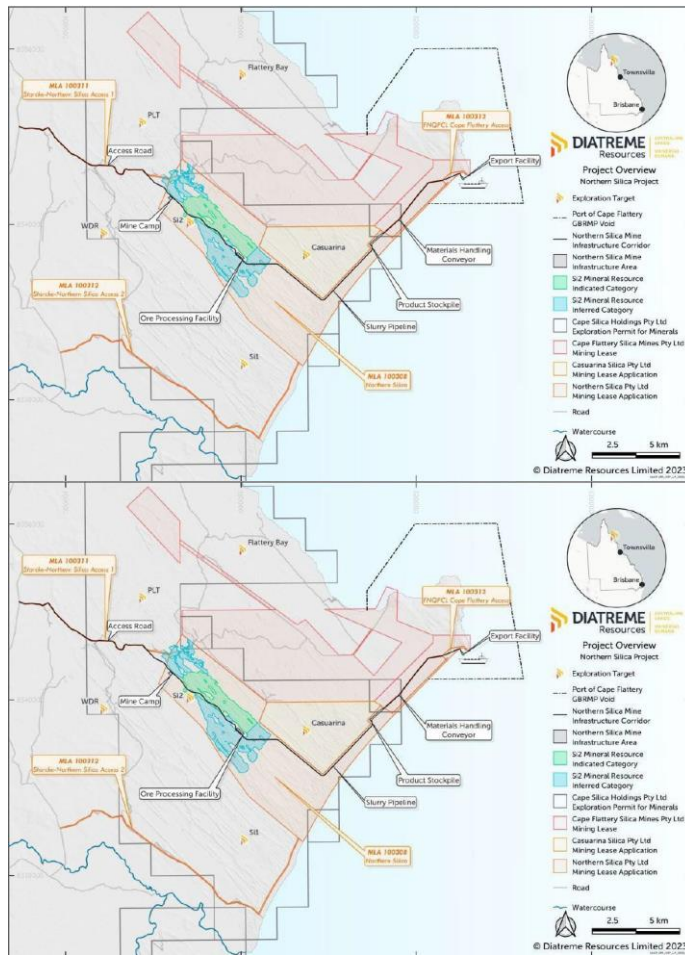
Source: PAEMAC's Port Infrastructure Report

Site Infrastructure

In regard to the site infrastructure, the study details that site infrastructure will cover approximately 10ha of the Mining Lease and is planned to accommodate roads, parking, mine offices etc which aid in the function of the overall site, while also creating specific areas for non-process areas, such as the Accommodation Village, Water Services and Electrical Services.

Figure 11: Diatreme Project Overview

Figure 8: Diatreme Project Overview



Source: Diatreme NSP Scoping Study

Altogether, the Scoping Study provides the capital cost estimate of \$355.6 million when operating at 3 Mtpa and \$534.8 million at 5 Mtpa. This estimate includes all direct (process and non-process infrastructure), indirect costs, contingencies, and other allowances. The estimates for marine infrastructure in Diatreme's scoping study are [quite low](#) compared to PAEMAC's report. This is because the capital costs in the scoping study outline the total capital cost for the project, while PAEMAC is specific only to the Port Infrastructure.

8.3 Environmental Issues

The Northern Silica Project will trigger a requirement for an Environmental Impact Statement (EIS). Diatreme

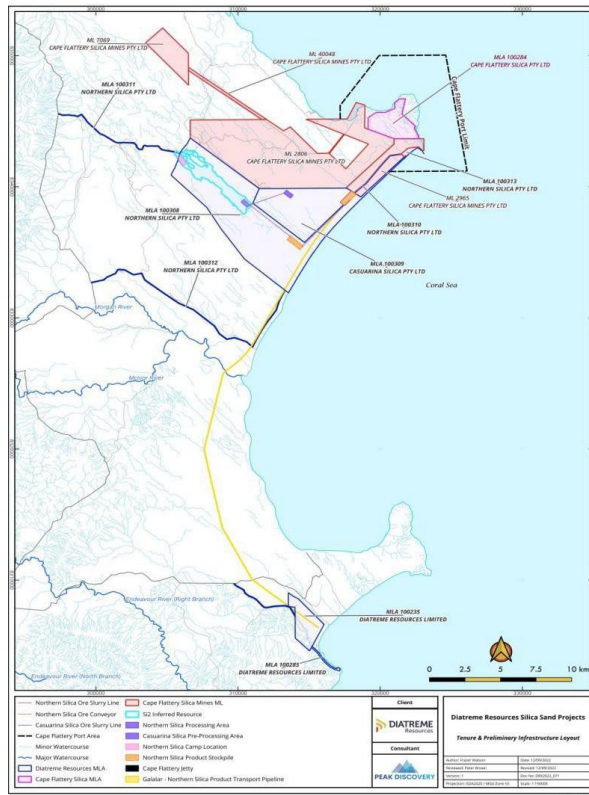
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[Figure 11: Diatreme Project Overview](#)

was recently declared a Coordinated Project. This provides an EIS pathway that supports both an Environmental Authority (EA) and a Controlled Activity Approval. Along with this, it will facilitate any associated permitting requirements that would otherwise be outside the assessment pathways of these approvals such as infrastructure access, maritime infrastructure arrangements and water allocations. The EIS process requires the collection of long-term data and modelling exercises with focus on water allocation, aquatic and terrestrial ecology, marine and coastal environment, soils, and cultural heritage. This will require various plans and analyses to be made such as the Social Impact Assessment.

Diatreme's ASX announcement on 21 October 2022 highlighted a new export option for their Galalar Project. The company plans to build a small diameter (300-500mm) pipeline through its current exploration tenure area EPM 17795 from the Galalar Mine Site to the designated Port area of Cape Flattery as shown below.

Figure 912: Diatreme's Slurry Pipeline Proposal



Source: Diatreme's 'Further export optionality identified for Galalar Project' Announcement

The new export option on the ASX announcement does not outline any costs associated with this option. However, this would require Diatreme to lodge infrastructure applications to the local government, further creating potential for environmental issues for the Galalar project, which has recently withdrawn its application for developing its EIS in 2023.

8.4 Forward Looking Statements

According to ASIC, forward looking statements such as production targets are inappropriate to state unless there are reasonable grounds to do so. The industry standard for reasonable grounds is the JORC Classification. More specifically, ASIC in accordance with Information Sheet 214 highlights that a correctly estimated ore reserve will be sufficient to establish reasonable grounds for a production target.

For Diatreme's Northern Silica Project, the JORC Code shows that only Measured, Indicated and Inferred Mineral Resources are reported. This implies a lower level of geological knowledge and confidence. Further, this classification does not consider any Modifying factors, which are used in the considerations for converting Mineral Resources to Ore Reserves including economic factors. Therefore, we lack confidence that the production target statements mentioned in the Scoping Study hold reasonable grounds for us to rely upon in accordance to ASIC guidelines (RG170). As such, Advisory Partner discounted statements regarding the

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the production target and only used the EV/Resource method to value the shares of Diatreme.

8.5 CFSM Sublease

A lease signed by Mitsubishi's Cape Flattery Silica Mines (Sublessee) with Far North Queensland Ports Corporation Limited (Sublessor) on 02 January 2018, highlights the Sublessee's rights for potential Prospective Users. As Diatreme requires access to this existing infrastructure, the company will be required to enter an agreement with Mitsubishi as either a Full or Part Facility User. As such, the following conditions may need to be met for DRX to use the port facility according to the Lease Document.

Table 4446: Key Conditions outlined in the Sublease Agreement

Reference	Description
A.1.7.3	An obligation on the part of the Facility user to concede priority rights for use of the Facility to the the Sublessee.
A.1.7.4	An obligation on the part of a Part Facility User to make good any damage caused to the Facility through its operations or actions of its workers
A.1.7.5	An obligation for Part Facility User to indemnify and release the Sublessor and Sublessee from liability and all claims any way connected with its use of the Facility as a Part Facility User
A.1.7.6	An obligation for Part Facility User to take out and maintain a policy of public liability insurance
B.3	As a Full Facility User, the Sublessee must be informed of the nature, extent and period of operations of the Prospective User. Along with this, the Prospective User must negotiate with the impact on Sublessee's business operations on the Land, the Reserve Throughput Capacity and anything that may be relevant as a result of the Prospective User's use of the facility
B.4	The rights of the Part Facility User under the licence will be subject to the Sublessee's rights of priority in the Essential User Terms referred to in A.1.7.3. This agreement will permit the Part Facility User to have access to and from Sublessor's Property via roads, pathways and other areas.
B.7	Sublessee will consent to a Prospective user who intends to be a Part Facility User to make use of the Sublessor's Property unless the Sublessee considers that the probable consequence would be to materially prejudice, disrupt or interfere with the use that the Sublessee makes of the Facility or the business it conducts from the Land, or the Sublessee will be prohibited from achieving its Reserve Throughput Capacity.
C.10.4	If the Sublessor decided to extend the wharf, a third party making use of the Extended Area may be a Part Facility User or a Full Facility User

Source: AP Analysis

According to Diatreme's Initial Advice Statement (IAS) as highlighted in Cowie Environmental Services report ([Appendix E](#)) and taken from the IAS, Diatreme acknowledges that they must gain approval for Mitsubishi's existing marine infrastructure. Extract from the Diatreme NSP IAS states the following:

"Within the Port of Cape Flattery, Diatreme will require access to a barge ramp to support initial construction as well as relevant maritime infrastructure for export of the silica product via an Ocean Going Vessel. At present, the following options (in order of preference) are being considered by Diatreme for maritime infrastructure to support the NSP:

1. *Use of an existing barge ramp operated by Cape Flattery Silica Mine (CFSM) in port limits and the use of the existing Port of Cape Flattery wharf (and conveyor structure) which is owned by the far North Queensland Ports Corporation (trading as Ports North) but operated by CFSM as the lessee. This option involves no new maritime infrastructure being developed for the NSP, although some minor modification*

to existing structures may be required. This option is subject to a suitable commercial and operational agreement being reached with CFSM and Ports North

2. Construction of a new rock barge facility within the limits of the port to support initial construction and then use of the same structure for ~~transshipment~~transshipment of silica product to a moored ocean-going vessel (OGV). The mooring arrangement for the OGV could either be at the existing berth of the Port of Cape Flattery Wharf (if there is capacity and the activity is permitted by the Port and CFSM) or else the construction of mooring dolphins seaward of the existing wharf.
3. Construction of a new barge facility as per option 2 and constructing a permanent extension to the existing wharf (e.g. via lengthening and/or widening of the wharf structure). This option allows for NSP operations to occur completely in parallel with existing CFSM operations.

There are ongoing commercial discussions between the Far North Queensland Ports Corporation Limited ('Ports North'), Diatreme and CFSM regarding the ability to share existing infrastructure. A 'part user' agreement is being developed that facilitates access to the Ports North land and to the Cape Flattery wharf for investigations to support the EIS. Pending these discussions and further investigations, a final maritime infrastructure option will be selected. However, this is anticipated to take several months and therefore all three maritime infrastructure options (outlined above) will be subject to environmental assessment as part of the EIS process."

If this "part user" agreement is not struck, or any other required agreements with CFSM are not made, Diatreme will be required to reassess their approach for NSP's marine infrastructure which leads to further unknown approval constraints.

The NSP Scoping Study further indicates that Diatreme has intentions to have a production capacity of 3Mtpa initially, then expanding to 5 Mtpa after two years of operations. This combined with Mitsubishi's current production rate, exceeds the current export limit for the facility under the existing Environmental Authority.

8.6 Enterprise value to resource tonne (EV/Resource) Method

As Diatreme has two major resources it explores, the total resources need to be considered. Therefore, different sets of comparable companies were identified. To identify possible comparators, the following screening criteria was used on Capital IQ:

- Industry Classification In Diversified Metals and Mining;
- Business Description includes "Heavy Metals" or "Silica"; and
- Company Type in Public Company.

This screening criteria allowed the search for any Silica Sand or Heavy Metal mining exploration companies which were publicly traded on the ASX. From the list, certain criteria were used to further filter the screen and return the most comparable companies that are applicable for the valuation of Diatreme. These criteria are summarised in the Table below, where green indicates the company meets the criteria, while red indicates that it does not.

Table 4547: Silica Sand Comparable Companies

Silica Sand Screen	Silica Sand	EV > \$15M	Silica as Major Resource	Market Cap > \$20M
Allup Silica Limited				
Australian Silica Quartz Group				
Carbine Resources Limited				
Industrial Minerals Ltd				
Metallica Minerals Limited				
VRX Silica Limited				

Source: Capital IQ and AP Analysis

Table 4648: Heavy Metals Comparable Companies

Heavy Metals Screen	Heavy Minerals	EV < \$100M	Zircon as majority Grade	Market Cap < \$130M
Astron Corporation Limited				
Astute Metals NL				
Base Resources Limited				
Heavy Minerals Limited				
Iluka Resources Limited				
Sheffield Resources Limited				

Source: Capital IQ and AP Analysis

From these tables, companies that met at least three (3) of the criteria were chosen as an appropriate comparable for Diatreme. The tables below outline the EV/Resource multiples for the chosen companies.

Table 4749: Silica Sand Comparable Companies Summary

Company Name	Development Stage	Market Cap (AU\$M)	EV (AU\$M)	Total JORC Resource Silica (Mt)	Implied EV/Resource
Metallica Minerals Limited	Feasibility Study	26.90	22.40	49.50	0.45x
Industrial Minerals Ltd	Exploration	16.50	15.40	12.40	1.24x
VRX Silica Limited	Feasibility Study	58.34	57.20	1,380.50	0.04x
Min		16.50	15.40	12.40	0.04x
Average		33.91	31.67	480.80	0.58x
Median		26.90	22.40	49.50	0.45x
Max		58.34	57.20	1,380.50	1.24x

Source: Capital IQ and AP Analysis

Table 4850: Heavy Minerals Mine Comparable Companies Summary

Company Name	Development Stage	Market Cap (AU\$M)	EV (AU\$M)	Total JORC Resource HM (Mt)	Implied EV/Resource
Astute Metals NL	Scoping Studies	11.91	9.90	127.00	0.08x
Base Resources Limited	Mining	163.74	21.7	57.82	0.38x
Heavy Minerals Limited	Scoping Studies	4.44	4.10	166.00	0.02x
Min		4.44	4.10	57.82	0.02x
Average		60.03	11.90	116.94	0.16x
Median		11.91	9.90	127.00	0.08x
Max		163.74	21.70	166.00	0.38x

Source: Capital IQ

The following observations were made with respect to the comparable companies:

- **Metallica Minerals Limited** is an exploration company, predominantly in Silica sand with their flagship project in the Cape Flattery Region.
- **Industrial Minerals Ltd** is a mineral exploration company with headquarters in Perth, with a portfolio of exploration projects in Western Australia, ~~foeussed~~[focused](#) on Silica Sands.

Inserted Cells

- **VRX Silica Ltd** is the most advanced pure-play silica sand company that is listed on the ASX and is has most projects located in Western Australia.
- **Astute Metals NL** is a diversified exploration company with operations in the US, Western Australia Northern Territory, with their [main](#) focus on the exploration of Heavy Mineral Sands.
- **Base Resources Limited** produces and sells heavy mineral sands in Africa, with a focus on Rutile, Ilmenite and Zircon. The company is dual listed on the ASX and UK's AIM.
- **Heavy Minerals Limited** is an Australian based Industrial minerals company, with projects in Western Australia.

Although these companies vary in their operations to Diatreme, the analysis provides an indicative range of EV/Resources that may be relevant for the purposes of valuing Diatreme. To derive an appropriate multiple, a weighting for each company must be determined. For the Silica Sand screen, all three companies satisfied the criteria, and thus, an equal weighting was given for all three companies. For the Heavy Minerals screening, a different weighting process was required. We ascribed 40% to companies which fulfilled every criterion and deducted 10% weighting for each characteristic missed. The following table highlights our analysis.

Table 4951: Multiples Summary

Analysis	EV/Silica Resource	EV/HM Resource
Minimum	0.04x	0.01x
Median	0.45x	0.02x
Average	0.58x	0.04x
Weighted Average	0.58x	0.05X
Maximum	1.24x	0.10x
Skew	0.89	1.68

Source: AP Analysis

To determine the skew, we used the formula below, which highlights the symmetry of a data set:

$$\frac{(n-1)(\sum (x_i - \bar{x})^3)}{(n-1)(\sum (x_i - \bar{x})^2)^{3/2}}$$


Through comparing the comparable list of companies to DRX's business operations, we have determined an appropriate weighting. As a result, we have determined the weighted average multiple and used this as the high end of our range. Furthermore, we have assessed the skew and statistical outliers within the comparable companies and as a such, determined that the median multiple to be used for the low valuation of our range.

As DRX's projects include Silica and Heavy Minerals, the two projects will be valued through a Sum of Parts once an Enterprise Value has been determined for each project. For Diatrema's Northern Silica Project, the appropriate EV/Silica Resource Multiple is determined to be in the range of 0.45x to 0.58x Silica Resource. Similarly, for Diatrema's Cyclone Project, we have determined the appropriate multiple to be in the range of 0.02x to 0.05x HM Resource.

8.7 Clermont Copper Gold Project

Diatreme holding 49% of the Clermont Copper Gold Project with Metallica Minerals holds 51%. The project does not have any JORC resources or reserves. We were able to identify a comparable transaction which was the sale of the Nullagine Gold Project in December 2023 to Calidus Resources Limited. The project was sold for \$250,000 plus a further payment of \$5,000,000 based on reaching certain production targets. The tenement area is 533 square kilometers.

The Clermont project is 252.36 square kilometers in the same region. Metallica has paid \$1,000,000 for its 51% of the project as part of its farm in arrangement with Diatrema. On a per square kilometer basis when

[comparing with the Nullagine Project it represents a comparable value for 100-% of the Clermont project of \\$2.48M. We have valued the 49% of Clermont project at \\$960,784, based on the valuation Metallica paid for the farm-in.](#)

8.78.8 Surplus Assets

Surplus assets are assets that form part of a business entity or company but do not contribute to the earnings or cash flow generation capacity of that business or company. These are assets which, if sold, would not impact on the revenue or profit generating capacity of the entity. From the analysis of Diatrema's financial statements, cash was concluded to be a surplus asset.

8.88.9 Valuation conclusion

Advisory Partner's value of Diatreme is derived from the EV/Resources multiple and is summarised as follows:

As Diatreme has excess cash, this was included [into](#) the Enterprise Value below. We have used the figures from the latest Annual Report on 31 December 2023 as the most current information on the cash and debt position.

Table 5052: Diatreme Net Cash Calculation

Diatreme (Net Debt) / Net Cash	Amount
Cash	30,272
(-) Current Portion of Debt	(1,525)
(-) Long Term Portion of Debt	-
Net Cash	28,747

Source: AP Analysis

Our valuation of Diatreme derived from the EV/Resources is summarised as follows. We have used an Resources multiple range of 0.45x to 0.58x for Silica and 0.02x to 0.05x for HM based on the comparable companies listed in section 7.1.

Table 5453: Diatreme Valuation Summary

Diatreme Valuation	Low	High
Silica Projects		
NSP Silica Resources (Mt tonnes)	235	235
Comparable EV/Resource Multiple	0.45x	0.58x
Enterprise Value of Silica Projects	106.34	136.3
Enterprise Value Attributable to DRX (73.2%)	77.84	99.77
WRA Silica Resources (Mt tonnes)	91.7	91.7
Galalar Silica Resources (tonnes)	75.46	75.46
Total Diatreme Silica Resources (tonnes)	402.16	402.16
Comparable EV/Silica Resource Multiple	0.45x	0.58x
Implied Enterprise Value	181.99	232.70
Silica Project Joint-Venture ownership	73.20%	73.20%
Implied Enterprise Value of WRA Resources Attributable to DRX (73.2%)	30.38	38.93
Cyclone Project Heavy Minerals Resources (Mttonnes)	203	203
Comparable EV/Resource Multiple	0.02x	0.05x
Implied Enterprise Value of Cyclone Project	4.06	10.15
Enterprise Value of Clermont Project Attributable to DRX (49%)	0.96	0.96
Sum of Parts (AU\$M)	142.28	148.85
Add/(Less):		
Net Cash	29	29
Equity Value (AU\$M)	141.03	177.60
	166.98	210.20

Source: AP Analysis

This represents a per share value below:

Table 5254: Diatreme Valuation Per

Share

Diatreme Valuation per Share		
	Low	High
Fair Value of Equity on a Controlling Basis	141.03 166.98	177.60 210.20
Fully paid ordinary shares outstanding	3,730	3,730
Outstanding Options & Performance Rights	67	67
Equity Value Per Share	0.037 0.044	0.047 0.055

Source: AP Analysis

We have assessed the value of Diatreme based on the EV/Resources method to be in the range of ~~\$0.037044~~ to ~~\$0.047055~~ per share.

8.98.10 Share Valuation Cross Check

To perform a share valuation cross check, Advisory Partner examined previous capital raises that Diatreme has performed. The five most recent are detailed below:

Table 5355: Diatreme's Recent Capital Raisings

Announce Date	Offering Type	Transaction Status	Offering Price	Total Shares Offered	Offering Size
					(000)
27/06/2022	Common Stock	Priced 27/06/2022	0.03	559,465,000	13,987
27/06/2022	Common Stock	Priced 29/08/2022	0.03	132,111,500	3,303
6/09/2021	Common Stock	Priced 6/09/2021	0.02	438,260,914	10,080
9/10/2020	Share Purchase Plan	Priced 15/10/2020	0.01	253,642,500	2,536
9/10/2020	Common Stock	Priced 9/10/2020	0.01	463,862,800	4,639
6/11/2019	Common Stock	Priced 21/11/2019	0.01	363,428,729	3,634

Source: Capital IQ

From the most recent capital raise of \$0.025 per share, it supports Advisory Partner's valuation of Diatreme's ~~shares to be in the range of \$0.025 to \$0.033.~~

shares to be in the range of \$0.025 to \$0.033.

9.0 Fair Value of Entity Post-Transaction

9.1 Share Valuation Cross Check

The total value of Diatrene post-transaction on a minority basis is outlined below.

Table 5456: Post Transaction Fair Value Summary

Value of entity post-transaction	Low	High
Equity Value of MLM	164.35 70.01	205.13 75.06
Equity Value of DRX	141.03 166.98	177.60 210.20
Total value of combined entity	305.38236.99	382.73285.26
DRX Shares Outstanding	3,729.76	3,729.76
New Shares Issued (1.3319 * MLM Shares)	1,278.52 321.14	1,278.52 321.14
Total Shares post-transaction	5,008.28 050.90	5,008.28 050.90
Fair Value of entity post-transaction (minority basis)	0.064047	0.076056

10.0 Assessment of Fairness

In forming our opinion in relation to the fairness of the Offer, we have valued each component of the proposal being the fair market value of a Metallica share and the fair market value of the consideration.

Table 5557: Fair Value

Fair Value	Unit	Low Value	High Value	Deleted Cells
Fair Value of Metallica share on a controlling basis	\$	0.223071	0.278076	
Fair Value of combined entity post-transaction (minority basis)	\$	0.061047	0.076056	
Premium / (Discount)		-34%	-7325%	Deleted Cells

Source: AP Analysis

Advisory Partner assessed the fair market value of Metallica shares, on a control basis, is between \$0.223071 and \$0.278076 per share. By comparison, the assessed value of the shares post-transaction is between \$0.061047 and \$0.076056. As demonstrated above, the value of the combined entity per share is lower than the value of a Metallica share and as a result, the Offer is considered not fair ~~or~~and not reasonable for shareholders of Metallica Minerals.

~~We note that we have valued the Metallica shares on a controlling basis, which allows for a 30% control premium.~~

11.0 Reasonableness

Reasonableness

We deem the offer to be not reasonable to shareholders of Metallica as we consider the disadvantages to outweigh the advantages of the offer. To assist the Shareholders in their decision-making process we have summarized the following:

- The likely advantages and disadvantages associated with the Offer; and
- Alternatives, including the position of Shareholders if the Offer does not proceed.

Shareholders of Metallica should read the full Report, where matters relevant to shareholders are explained in more detail.

Advantages of Approving the Offer

Set out below is a summary of the key advantages to the Shareholders of accepting the Offer.

- **Liquidity of shares**
Metallica shareholders currently face illiquidity in the trading of their shares. On a typical trading day, Metallica shares are thinly traded and have a wide bid-ask spread. As a result, it is difficult to sell shares in Metallica. The transaction may improve liquidity in the shares of the combined entity by increasing the market capitalisation and outstanding share count.
- **Economies of Scale**
The combined entity may provide operational improvements for the mines as both companies hold an interest in mines within the same vicinity.

Disadvantages

- **Dilution of Shares**
As both companies have projects which are pre-development, shareholders are at risk of future capital ~~raising~~[raisings](#) which may dilute minority shareholders. The non-associated shareholders (excludes common shareholders) of Metallica Minerals and Diatreme Resources account for 49.87% of total shares in Metallica Minerals. This takeover offer sees that decrease to 12.73% of total shares in Diatreme. Diatreme's projects hold 513 Mt of resources, while Metallica holds 47 Mt of reserves at their CFS project according to the feasibility study. As such, Diatreme will require substantial efforts to acquire funding for the projects relative to Metallica, which are likely to be through the issuance of new ordinary shares.
- **Diatreme Funding Risk and Dilution**
[If Diatreme successfully acquires Metallica Minerals, the company will be required to raise capital to fund the CFSS Project. This will further dilute the non-common Metallica shareholders who will already represent a minority interest in Diatreme \(as stated in the above dot point\). Our valuation of Metallica accounts for the dilution discount applied to the CFSS Project as outlined in Section 6.5 and Appendix G. The post-transaction valuation accounts for the dilutive discount of CFSS and the dilutive impact of the consideration. As set out in the post-transaction valuation, the value of the entity, including Diatreme, does not outweigh the value of Metallica.](#)
- **Voting Power**
Diatreme has 3.7bn shares outstanding pre-transaction and will issue 1.278bn shares to Metallica shareholders for the transaction. As such, [non-associated](#) Metallica shareholders will represent ~~42.73~~[25.6](#)% of total shares post-transaction which is a minor representation in voting power relative to their prior 100% voting power in Metallica Minerals Limited.
- **Project Risk**
Diatreme's Northern Silica projects are at scoping study stage. This early stage of development has not been proven to be economically viable by an independent technical expert and may face unforeseeable factors in order to develop the project in terms of operational costs, environmental-

requirements, capital expenditures, and other variables which may impact the value of the mine. By accepting the offer, Metallica shareholders will be exposed to these risks which may determine whether or not these mines are viable and whether they can be funded.

Other Considerations

- **Common Shareholders**

Metallica and Diatreme have common shareholders. Ilwella Pty. Ltd (“Ilwella”) and SCR-Sibelco N.V. (N.V.) are the top two shareholders of both Diatreme and Metallica Minerals. Sibelco publicly backed the takeover offer from Diatreme. Furthermore, Delphi Unternehmensberatung AG (Delphi AG) controls Sparta AG. In particular, Delphi AG owns 100% of VVBeteiligungen AG, a majority shareholder of Deutsche Balaton AG which has a majority ownership of Sparta AG. With Metallica’s top three shareholders being Ilwella, Sibelco and Sparta AG this takeover suggests limited dilution for major shareholders who continue to retain a significant ownership of Diatreme post-takeover of Metallica.

- **Mitsubishi (CFSM) Sublease**

Diatreme is required to build significant port infrastructure near CFSM’s operations and wishes to utilise the existing wharf. The Sublease between Far North Queensland Ports Corporation Ltd and Cape Flattery Silica Mines Pty Ltd (CFSM) gives CFSM certain rights that may make this difficult both during operations and construction. However, PAEMAC’s report states that the construction of Diatreme’s port infrastructure will cause unavoidable disturbances to Mitsubishi’s operations. As such, it gives CFSM reasons to not allow Diatreme to access the existing infrastructure or proceed with the planned construction activities. This would impact Diatreme’s ability to export.

Shareholder circumstances

Advisory Partner has not considered the effect of the Offer on the particular circumstances of individual Shareholders. Some individual Shareholders may place a different emphasis on various aspects of Proposed Transaction from that adopted in this Report. Accordingly, individuals may reach different conclusions as to whether or not the Offer is in their individual best interests. The decision of an individual Shareholder in relation to the Offer may be influenced by their particular circumstances (including their taxation position) and accordingly, Shareholders are advised to seek their own independent advice.

Other matters

This Report has been requested by the Metallica Directors to assist the Shareholders in their decision to accept or reject the Proposed Transaction.

This Report should not be used for any other purpose and Advisory Partner does not accept any responsibility for its use outside this purpose. Except in accordance with the stated purpose, no extract, quote or copy of our Report, in whole or in part, should be reproduced without our written consent, as to the form and context in which it may appear.

Advisory Partner acknowledges that this Report may be lodged by the Directors with the ASX.

12.0 Qualifications, Declarations, and Consents

12.1 Qualifications

Advisory Partner provides corporate advisory services in relation to mergers and acquisitions, capital raisings, corporate restructuring and financial matters generally. One of its activities is the preparation of company and business valuations and the provision of independent advice and expert's reports in connection with mergers and acquisitions, takeovers and schemes of arrangements. Advisory Partner's Director has prepared a number of public expert's reports.

The principal person responsible for preparing this Report on behalf of Advisory Partner is Brett Plant, BBus, MCom, FCA, he is a Director of Advisory Partner. Mr Plant has been actively involved in the preparation of this report. Mr Plant has in excess of 20 years experience in the commerce and the accountancy profession and has been involved in specialist corporate advisory services including company valuations, business sales, due diligence investigations, independent experts' reports as well as other corporate investigations for more than 10 years. Mr Plant has the appropriate experience and professional qualifications to provide the advice offered.

12.2 Declarations

It is not intended that this Report should be used or relied upon for any purpose other than as an expression of Advisory Partner's opinion as to whether the Offer is fair and reasonable and for Shareholders of Metallica as a whole. Advisory Partner expressly denies any liability to any Shareholder who relies or purports to rely on this Report for any other purpose and to any other party who relies or purports to rely on this Report for any purpose.

This Report has been prepared by Advisory Partner with care and diligence and the statements and opinions given by Advisory Partner in this Report are given in good faith and in the belief on reasonable grounds that such statements and opinions are correct and not misleading. However, no responsibility is accepted by Advisory Partner or any of its directors, officers or employees for errors or omissions however arising in the preparation of this Report, provided that this shall not absolve Advisory Partner from liability arising from an opinion expressed recklessly or in bad faith (unless the law otherwise requires).

12.3 Independence

Advisory Partner is entitled to receive a fee of \$55,000 to \$65,000 (exclusive of GST) for the preparation of this Report. Advisory Partner is also entitled to be reimbursed for any out-of-pocket expenses incurred in the preparation of this Report. Except for this fee and the reimbursement of these expenses, Advisory Partner has not received and will not receive any pecuniary or other benefit, whether direct or indirect, in connection with the preparation of this Report.

Neither the signatory to this Report nor the Advisory Partner holds securities in Metallica Minerals. No such securities have been held at any time over the last two years.

Neither the signatories to this Report nor Advisory Partner have had within the past two years any business relationship material to an assessment of Advisory Partner's impartiality with in Metallica Minerals or its associates.

Prior to accepting this engagement, Advisory Partner considered its independence with respect to Metallica Minerals and any of its respective associates with reference to ASIC Regulatory Guide 112 entitled "Independence of Experts". In Advisory Partner's opinion, it is independent of in Metallica Minerals and its associates.

A draft of this Report was provided to Metallica and its advisors for confirmation of the factual accuracy of its contents. No significant changes were made to this Report as a result of this review and there was no alteration to the methodology, evaluation or opinions set out in this Report as a result of issuing the draft.

12.4 Indemnity

[INDEPENDENT-EXPERT-REPORT-METALLICA-MINERALS | Limited liability by a scheme approved under Professional Standards Legislation.](#)

Under the terms of our engagement, Metallica has agreed that no claim shall be made by Metallica or any of its subsidiaries against Advisory Partner, any of their directors, officers, partners, employees or agents (Indemnified Persons) to recover any loss or damage which Metallica or any of its subsidiaries may suffer by reason of or arising out of anything done or omitted in relation to the provision of the services by Advisory Partner, provided that such loss or damage does not arise from the negligence or willful default of any of the Indemnified Persons. Metallica has unconditionally indemnified Advisory Partner and their respective officers, employees and agents against any losses, claims, damages, liabilities, costs, expenses and outgoings whatsoever (Losses) which they may suffer or incur directly or indirectly arising out of:

- Advisory Partner relying on information provided by Metallica or any of its employees, agents or advisers; or
- Metallica failing to provide Advisory Partner with material information in relation to the Proposed Transaction.

Further, Metallica must pay and must indemnify Advisory Partner against any Losses in relation to any investigations, enquiries or legal proceedings by ASIC or any other competent regulatory body arising out of, or in connection with, the Proposed Transaction, including reasonable legal expenses and disbursements incurred by Advisory Partner and fees payable to Advisory Partner attributable to time reasonably spent by its staff assessed at its hourly rates to the extent that investigation, enquiry or legal proceeding is not caused by an act or omission of the Indemnified Persons.

12.5 Consents

Advisory Partner consents to the issuing of this Report in the form and context in which it is to be included in the Target Statement to be sent to the Shareholders. Neither the whole nor any part of this Report nor any reference thereto may be included in, or attached to, any other document without the prior written consent of Advisory Partner as to the form and context in which it appears.

Advisory Partner takes no responsibility for the content of the Target Statement or any other documents provided to the Shareholders, other than this Report.

12.6 Other

The opinion of Advisory Partner is made at the date of this Report and reflects circumstances and conditions as at that date. In particular, Advisory Partner provides no representations or warranties in relation to the future value of shares of Metallica.

Shareholders who are in any doubt as to the action they should take should consult their own independent professional advisers.

Advisory Partner has prepared a Financial Services Guide as required by the Act. The Financial Services Guide is set out at the beginning of this Report.

Appendix A: Sources of Information

In preparing this report we have had access to and relied upon the following principal sources of information:

- In preparing this report, Advisory Partner identified certain matters that required specialist expertise. In particular, given the importance of Metallica's definitive feasibility study (DFS) in our assessment of value, we considered it appropriate to seek a specialist expert assessment of the reasonableness of the assumptions underlying the DFS, the conclusions in the DFS and whether any critical risks have been omitted from the DFS. We also sought some general observations from SRK on the mining and geological information available in Diatreme's scoping study. SRK was engaged by us and provided that feedback and any additional commentary on areas we considered appropriate to confirm. Relevantly, SRK was not engaged to value the Mineral Resources or mining tenements of Metallica, nor provide a report in accordance with the VALMIN Code on any matter nor to review and comment on a final draft of this report. Accordingly, we are comfortable, based on the work that SRK has undertaken under our engagement with them, that our valuation of the Cape Flattery Project, which we have undertaken on a discounted cash flow basis (DCF), is appropriate, is based on reasonable assumptions and is not subject to any critical flaws. In seeking this specialist input from SRK, we are satisfied that SRK is independent of Metallica;
 - audited annual reports of Metallica for the years ended 30 June 2021 to 30 June 2023;
 - audited accounts for half-year ended 31 December 2023;
 - details of Metallica's shareholders and share register as at 30 June 2023;
 - historical trading volumes and prices of Metallica's ordinary shares traded on the Australian Stock Exchange ("ASX");
 - various ASX announcements;
 - meeting with management and management working papers in relation to the transaction;
 - Statement on Monetary Policy, Reserve Bank of Australia, February 2023;
 - Prime Gain Limited Market Report;
 - PAEMAC Report ([Appendix D](#));
 - Cowie Environmental Services Report ([Appendix E](#));
 - S&P Capital IQ;
 - Definitive Feasibility Study July 2023 and Updated November 2023;
 - Diatreme NSP Scoping Study June 2023;
 - other publicly available information on Metallica and Diatreme.
- In addition to the above, Advisory Partner has had various discussions with the management, officers and advisers of Metallica regarding the nature of Metallica's businesses, their operations, financial position and prospects.

Appendix B: Valuation Methods

In conducting our assessment of the fair market value of the Company, the following commonly used business valuation methods have been considered:

Discounted Cash Flow Method

The discounted cash flow (“DCF”) method is based on the premise that the value of a business or any asset is represented by the present value of its future cash flows. It requires two essential elements:

- the forecast of future cash flows of the business asset for a number of years (usually five to 10 years); and
- the discount rate that reflects the riskiness of those cash flows used to discount the forecast cash flows back to net present value (“NPV”).

DCF is appropriate where:

- the businesses’ earnings are capable of being forecast for a reasonable period (preferably five to 10 years) with reasonable accuracy;
- earnings or cash flows are expected to fluctuate significantly from year to year;
- the business or asset has a finite life;
- the business is in a 'start up' or in early stages of development;
- the business has irregular capital expenditure requirements;
- the business involves infrastructure projects with major capital expenditure requirements; or
- the business is currently making losses but is expected to recover.

Capitalisation of Future Maintainable Earnings Method

This method involves the capitalisation of estimated future maintainable earnings by an appropriate multiple. Maintainable earnings are the assessed sustainable profits that can be derived by the vendor’s business and excludes any one off profits or losses. An appropriate earnings multiple is assessed by reference to market evidence as to the earnings multiples of comparable companies.

This method is suitable for the valuation of businesses with indefinite trading lives and where earnings are relatively stable or a reliable trend in earnings is evident.

Net Realisable Value of Assets

Asset based valuations involve the determination of the fair market value of a business based on the net realisable value of the assets used in the business.

Valuation of net realisable assets involves:

- separating the business or entity into components which can be readily sold, such as individual business units or collection of individual items of plant and equipment and other net assets; and
- ascribing a value to each based on the net amount that could be obtained for this asset if sold.

The net realisable value of the assets can be determined on the basis of:

- *orderly realisation*: this method estimates fair market value by determining the net assets of the underlying business including an allowance for the reasonable costs of carrying out the sale of assets, taxation charges and the time value of money assuming the business is wound up in an orderly manner. This is not a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value;

- *liquidation*: this is a valuation on the basis of a forced sale where the assets might be sold at values materially different from their fair market value; or
- *going concern*: the net assets on a going concern basis estimates the market value of the net assets but does not take into account any realisation costs. This method is often considered appropriate for the valuation of an investment or property holding company. Adjustments may need to be made to the book value of assets and liabilities to reflect their going concern value.

The net realisable value of a trading company's assets will generally provide the lowest possible value for the business. The difference between the value of the company's identifiable net assets (including identifiable intangibles) and the value obtained by capitalising earnings is attributable to goodwill.

The net realisable value of assets is relevant where a company is making sustained losses or profits but at a level less than the required rate of return, where it is close to liquidation, where it is a holding company, or where all its assets are liquid. It is also relevant to businesses which are being segmented and divested and to value assets that are surplus to the core operating business. The net realisable assets methodology is also used as a check for the value derived using other methods.

These approaches ignore the possibility that the company's value could exceed the realisable value of its assets.

Share Market Trading History

The application of the price that a company's shares trade on the ASX is an appropriate basis for valuation where:

- the shares trade in an efficient market place where 'willing' buyers and sellers readily trade the [company's shares; and](#)
- the market for the company's shares is active and liquid.

Constant Growth Dividend Discount Model

The dividend discount model works best for:

- firms with stable growth rates;
- firms which pay out dividends that are high and approximate free cash flow to equity;
- firms with stable leverage; and
- firms where there are significant or unusual limitations to the rights of shareholders.

Special Value

Special value is the amount which a potential acquirer may be prepared to pay for a business in excess of the fair market value. This premium represents the value to the potential acquirer of potential economies of scale, reduction in competition or other synergies arising from the acquisition of the asset not available to likely purchasers generally. Special value is not normally considered in the assessment of fair market value as it relates to the individual circumstances of special purchases.

Appendix C: Discount Rate

Overview

When applying the discounted cash flow method, the cash flows expected to be generated by an asset are discounted to their present value by using a discount rate that reflects the relative risk of the investment, as well as the time value of money.

Selection of an appropriate discount rate to apply to the forecast cash flows of a company fundamentally is a matter of judgment. There is a formulaic approach that can and is derived by theory; however, a mechanistic application of financial theory can result in a discount rate that is not applicable in reality. Hence, it should be stressed that there is no "correct" discount rate. Despite the growing acceptance and application of various theoretical models, many company may rely on less sophisticated approaches and use relatively arbitrary "hurdle rates" which do not vary significantly over time despite interest rate movements.

There are three main considerations to the determination of an appropriate WACC, namely cost of equity, cost of debt and debt/equity mix.

The cost of equity was derived from the Capital Asset Pricing Model ("CAPM") methodology. The CAPM is probably the most widely accepted and used methodology for determining the cost of equity capital. However, while the theory underlying the CAPM is rigorous, the practical application is subject to shortcomings and limitations and the results of applying the CAPM model should only be regarded as providing a general guide.

Weighted Average Cost of Capital (WACC)

To ensure consistency with the cash flow projections of Metallica, the WACC should be on a nominal post tax basis. The standard formula used to calculate a nominal post tax WACC under a dividend imputation system is given by:

$$WACC = \frac{E}{E+D} r_E + \frac{D}{E+D} r_D (1 - t_c + \gamma t_c)$$

Where:

V	sum of debt and equity values;
E	value of equity;
D	value of debt;
Re	cost of equity;
Rd	cost of debt;
t_c	the corporate tax rate; and
γ	the value of imputation tax credits (gamma)

This is an after-tax discount rate to be applied to nominal ungeared after-tax cash flows.

Overview of the CAPM Framework

The CAPM provides a theoretical basis for determining a discount rate that reflects the returns required by diversified investors in equities. CAPM is based on the assumption that investors require a premium for investing in equities above risk free investments (such as Australian government bonds). The premium is commonly known as the market risk premium and notionally represents the premium required to compensate for investment in the equity market in general.

The risks associated with an investment in a company can be classed as either specific risks or systematic risks. The risks associated with an investment in a company can be classed as either specific risks or systematic risks. The risks associated with an investment in a company can be classed as either specific risks or systematic risks.

risks. Specific risks are risks that are specific to a particular company or business and are unrelated to movements in equity markets. Systematic risk is the risk that returns from an investment or business will vary with market returns in general. If returns on an investment are expected to be perfectly correlated with

returns on the market, then the return required on the investment would be equal to the return required from the market (ie. the risk-free rate plus the market risk premium).

CAPM postulates that the return required on investment or assets can be estimated by applying to the market risk premium a measure of systematic risk described as the equity beta factor. The equity beta for an investment reflects the covariance of the return from that investment with the return from the market as a whole. Covariance is a measure of relative volatility and correlation. The equity beta of an investment represents its systematic risk only. It is not a measure of the total risk of a particular investment. In general, an investment with an equity beta greater than 1 is riskier than the market and an investment with a beta of less than 1 is less risky.

The formula for deriving the cost of equity using CAPM is as follows:

$$\begin{aligned} RR_{eq} &= RR_{rf} + \beta(RR_{mm} - RR_{rf}) \\ R_e &= R_f + \beta(R_m - R_f) \end{aligned}$$

Where:

RR_{eq} is the expected return on equity;
 RR_{rf} is the risk free rate;
 β is the equity beta factor;
 RR_{mm} is the expected market return; and
 $RR_{mm} - RR_{rf}$ is the market risk premium.

The equity beta for a company is normally estimated by observing the historical relationship between returns from the company or comparable company and returns from the market in general. In our analysis, we have chosen to observe the historical 3-year relationship between returns from comparable companies to Metallica.

Risk free rate

The risk-free rate compensates the investor for the time value of money including the expected inflation rate over the investment period. In practice, for going concern Australian companies, the ten-year Commonwealth Government Bond rate is a widely used and accepted proxy for the risk-free rate. This rate is a nominal rate and therefore includes inflation.

For the purpose of this report, Advisory Partner has adopted the ten-year Australian Government Bond rate as at 1st of March 2024 at 4.12% as a proxy for the risk-free rate in determining the cost of equity for Metallica.

Equity market risk premium

The market risk premium ($R_m - R_f$) represents the additional return that investors require to invest in equity securities as a whole over a risk-free investment which is not observable and therefore a historical premium is used as a proxy. Australian studies¹ have been limited but indicate that the long run average premium has been in the order of 6.0-6.5% measured over more than 100 years of data.

The market risk premium is not constant and may change over time as investors perceive that equities are more risky than at other times and will increase or decrease their expected premium.

A market risk premium of 6.0-6.5% has been assumed which Advisory Partner believes is within the range of generally accepted figures of long-term market risk premiums in the Australian capital market.

Beta

The beta coefficient is a measure of the expected volatility and therefore risk of a company's stock relative to the market portfolio.

The beta of a stock is determined by the characteristics of the firm and is generally based on three factors:

- the nature of revenue and the extent to which it is cyclical;
- operating leverage; and
- financial leverage.

The expected beta cannot be observed; therefore, the historical beta is usually used as a proxy for the expected beta. A beta can be estimated by regressing the excess returns of the stock or comparable against the excess returns of the index representing the market portfolio.

Equity Beta estimate

To obtain an equity beta, Advisory Partner has considered the betas of [silica sand and heavy metal](#) explorers and producers listed on the ASX. [We've assessed the comparable business operations between Metallica and the following companies in Appendix E.](#) The betas for listed silica sands comparable companies and other mining companies that may be considered comparable to Metallica are listed below.

Ticker	Name	Total Debt	Mkt. Cap.	Debt / Capital	Levered 5-Year Beta (5-year)	Unlevered Beta	
ASX:DRX	Diatreme Resources Limited	1.53	78.30	1.91%	0.67	0.66	
ASX:IND	Industrial Minerals Ltd	0.14	14.40	0.96%	-0.71	-0.71	-0.71
ASX:ASQ	Australian Silica Quartz Group	0.00	14.10	0.00%	0.88	0.88	
ASX:FL1	First Lithium Limited	0.00	26.30	0.00%	0.12	0.12	0.12
ASX:INF	Infinity Lithium Corporation Limited	0.00	33.80	0.00%	1.36	1.36	
ASX:MMC	Mitre Mining Corporation Limited	0.00	25.40	0.00%	0.51	0.51	0.51
ASX:EV1	Evolution Energy Minerals Limited	0.00	25.90	0.00%	0.73	0.73	
ASX:ZNC	Zenith Minerals Limited	0.00	30.00	0.00%	1.49	1.49	
ASX:GRE	GreenTech Metals Limited	0.00	23.10	0.00%	1.03	1.03	
ASX:VRC	Volt Resources Limited	0.00	26.80	0.00%	1.21	1.21	
ASX:AZI	Altamin Limited	0.00	21.90	0.00%	1.66	1.66	
ASX:SRX	Sierra Rutile Holdings Limited	0.00	25.60	0.00%	NA	NA	NA
ASX:MLM	Metallica Minerals Limited	0.40	26.90	1.47%	1.05	1.04	
Min		0.00	14.10	0.00%	-0.7167	-0.7166	
Median		0.00	26.4035	0.00%	0.88112	0.88112	
Mean		0.4419	29.6331.74	0.24%	0.84113	0.84113	
Max		1.53	78.30	1.91%	1.66	1.66	

1. The impact of differing capital structures is removed in the calculation of the unlevered betas (Asset Beta).

There are significant measurement issues with beta, which means that only limited reliance can be placed on such statistics. Even measurement of historical betas is subject to considerable variation. It requires a considerable degree of judgement.

The beta is measured on the cash flows returned to equity holders and is therefore after interest. Accordingly, a firm's beta also reflects its capital structure. Since financial leverage is likely to alter between

firms it is generally erroneous to make comparison of betas between firms without regard to each firm's leverage. Accordingly, the Company's target debt and equity mix is relevant.

The betas can all be degeared (or 'delevered') to remove the impact of leverage. The method is set out below:

$$\text{Beta(ungearred)} = \frac{\text{Beta(gearred)}}{(1 + \frac{D}{E} \times (1 - t_c))}$$

The ungeared or 'asset' betas can then be analysed to determine an appropriate asset beta for the subject of the valuation, and it can be regearred (or 'relevered') to reflect the appropriate capital structure. Rearranging the above equation, we have:

~~DDDD+DD(=DDDD+DD) = DDD+DD(=DDDD+DD) x 1 +~~

$$\text{Beta}(\text{geared}) = \text{Beta}(\text{ungeared}) \times \left(1 + \frac{D}{E}\right)$$

The table on the previous page indicates that the median beta for comparable business is approximately ~~0.88~~1.12, and when unlevered is approximately ~~0.84~~1.12.

Given the differences between Metallica and the comparable companies, at best we regard the data as relevant and informative but not determinate.

We have adopted the average and median unlevered beta of ~~0.84~~1.12 and ~~0.88~~1.13 for the low and high our analysis.

Cost of Debt Capital

The rate of return required by providers of debt capital is the rate a prudent debt investor would require on interest bearing debt. This rate should reflect the long-term rate of interest required by a debt provider to a business such as the business subject to valuation.

Metallica does not carry any interest-bearing debt, however, for the purposes of evaluating a discount rate under the WACC/CAPM framework, we've anticipated borrowing costs of the company over the forecast period. The management team of Metallica have provided an unsigned term sheet for a \$100m debt facility at 12% interest rate. We've used this as a proxy to estimate the cost of debt and believe ~~a range of 10-15~~12% is an appropriate pre-tax cost of debt figure.

In recognition that WACC is applied to ungeared after tax cash flow projections and that interest payments to debt providers creates a tax shield, the resulting adjusted debt rate for inclusion in the WACC calculation is ~~08.4~~8.4%.

The rate of tax used for calculating the tax shield adjustment is 30%, representing the corporate rate of tax.

Imputation Credits (Gamma)

The WACC set out above assumes a "classical" tax system. The CAPM model is constructed to derive returns to investors after corporate taxes but before personal taxes. Under the US classical tax system, interest expense is deductible to a company but dividends are not. Investors are also double-taxed on dividends received.

Under Australia's dividend imputation system, domestic equity investors now receive a taxation credit (franking credit) for any tax paid by a company, hence eliminating the double taxation associated with US

dividends. There are schools of economic thought that argue that the taxation benefits of dividend imputation should be incorporated into any analysis of value. However, Australian studies of the relative value of dividend imputation are controversial and have produced mixed results.

It is worth noting that franking credits can only be utilised in the hands of domestic Australian investors and to a lesser extent, superannuation funds who are eligible for a refund of unused imputation credits (provided that franking credit trading rules are met). Foreign investors are unable to access attached franking credits and hence attribute no additional value to franking credits.

While a number of studies point towards the proposition that some value should be attributed to dividend-

imputation, Advisory Partner considers that the evidence provided by the different schools of thought as to the value that investors attributes to dividend imputation is unclear and as a result we have attributed no value to the Imputation Credits.

Debt and equity mix

According to the principles of modern portfolio finance theory on capital structure an investor, as owner, in a business would seek to utilise an appropriate amount of debt capital in the financial structure of the business on the basis that debt capital is generally cheaper than equity capital and the cost thereof is generally tax deductible. This proposition is balanced, however, with the fact that as the proportion of debt is increased, the financial risk of the business is increased. Accordingly, a target proportion of debt to total capital employed in the business is sought which balances the advantages of this source of funds with the disadvantages attached thereto.

Modern finance theory does not provide a solution to determine the optimum level of gearing in a business, however the use and amount of debt used by participants in the market is observable. Consequently, we have made reference to the debt/capital of comparable companies noted on page 4839 in order to benchmark an appropriate level of gearing to assume for the purposes of deriving the WACC applicable to the business of Metallica. We have also had regard to MLM's current gearing level.

In arriving at an appropriate capital structure for Metallica we have had regard to the capital required to fund the initial capex for the project. According to the discounted cash flow analysis, the company requires \$240m in capital expenditures from July 2025 to July 2027. Metallica has provided a term sheet, unsigned, which offered \$100m in debt. As such, we've assumed the remaining \$140m is to be equity. \$236.7m in initial capital expenditures according to the Update Definitive Feasibility Study. Metallica have engaged Argonaut Capital to assist in raising debt capital for the CFSS Project. The company has had, and continues, to be in discussions with multiple debt providers. Metallica has been in discussions with, and continues to undergo discussions with numerous debt providers for financing options. Additionally, Metallica were offered a term sheet for \$100m in debt at a rate of 12%.

We consider the appropriate capital structure is based upon the capital required to fund the project. Based on this, we and have used deemed that a 40% debt and 60% equity is a reasonable target capital structure of 40% debt and 60% equity.

Specific Company Risk

A company's cost of equity as derived by the CAPM reflects the level of systematic (or non-diversifiable) risk borne by the company. It does not reflect non-systematic or company specific risks that are inherent in Metallica's operations.

- Project Risk**
 There are general operational risks associated with mining that may cause delays in production or affect expected cashflows from the project. These may include equipment and maintenance, variability in quality of deposits, labour disputes, groundwater issues and other risks which may impact the project value.

Financial Risk

There are great financial funding requirements to develop a mining project. There are risks associated with Metallica Minerals' ability to raise the capital required to fund the project. The raising of equity capital may be required to develop CFS, as such, there is a risk that shareholders will face dilution. In addition, there are risks that development will exceed expected costs and cause

~~project delays. Further, the price of the product may shift due to changes in the supply and demand of the market.~~

- **Environmental Risk**

Mining projects face unique environmental risks which impact production including habitat disruption, water pollution, or air emissions. There are regulatory and legal requirements to fulfill which may take longer than expected, or these requirements may change during the pre-development phase. Metallica had previously faced delays due to the Department of Climate Change, Energy, the Environment, and Water (DCCEEW) decision to require an Environmental Impact Statement (EIS) for the project.

- **Weather Risk**

The feasibility study plans that the mine will be operational 365-days per year and is based on a Time Usage Model (TUM). This has been historically demonstrated by the nearby Mitsubishi mine, however, there is risk of significant weather events as the project operates in tropical northern Queensland and is exposed to cyclone risk.

~~A specific company risk premium of 7.00% has been included to adjust the cost of equity for these company specific risk factors.~~

[We consider that calculating a dilution at the current market prices allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.](#)

These company-specific risks in this situation include a number of the legal risks discussed in this report but also include issues associated with the size and lack of liquidity in the stock.

Summary of WACC Parameters

The table below summaries the parameters used and Advisory Partner's determined WACC range.

Weighted Average Cost of Capital	Low	High
Cost of Debt		
Pre-Tax Cost of Debt	4.0 12%	4.5 12%
Tax Rate	30%	30%
After-Tax Cost of Debt	7.0 8.4%	10.5 8.4%
Cost of Equity		
Unlevered Equity Beta	0.8 1.12	0.8 1.13
Relevered Equity Beta	1.49 6 4	1.29 6 5
Equity Market Risk Premium	6.50%	6.50%
MLM Equity Risk Premium	7.7 510.68%	8.3 910.75%
Risk Free Rate	4.12%	4.12%
Specific Company Risk	7.2 0.00%	7.3 0.00%
Cost of Equity	18.8 716.80%	19.5 17.87%
Proposed Capital Structure		
Debt % Mix	40%	40%
Equity % Mix	60%	60%
Capital	100%	100%
Debt/Equity	0.67	0.67
Weighted Average Cost of Capital (WACC)	14.1 13.44%	15.9 14.08%

Source: Capital IQ Pro and AP [Analysis](#)

Appendix D: Comparator Descriptions

Altamin Limited

Metallica Minerals Limited and Altamin Limited are both Australian-based companies engaged in the mining and development of mineral resources. Each company operates with a strong focus on specific mineral projects and aims to cater to a global customer base. Metallica Minerals and Altamin Limited are actively involved in extracting valuable minerals, emphasizing strategic operations and international market outreach to capitalize on their respective resource-focused business models.

Australian Silica Quartz Group Ltd

Metallica Minerals Limited and Australian Silica Quartz Group Ltd. are similar in that both are Australian-based companies primarily engaged in the extraction and development of silica sand, aiming to serve a global customer base. Each company focuses on the strategic exploration and development of mineral resources specific to their operational interests, with Metallica Minerals targeting high-purity silica sand, while Australian Silica Quartz Group concentrates on both high-grade silica sand and hard rock quartz. Both companies leverage Australia's rich mineral resources to meet the demands of international markets.

Diatreme Resources Limited

Metallica Minerals Limited and Diatreme Resources Limited share common ground as Australian-based companies that focus on the exploration and development of mineral resources. Both companies have a specific interest in silica projects, with Metallica Minerals developing high-purity silica sand and Diatreme Resources focusing on its Northern Silica project in Far North Queensland. Each company aims to harness Australia's mineral resources to address demands in global markets, leveraging their expertise in mineral extraction and development.

Evolution Energy Minerals Limited

Metallica Minerals Limited and Evolution Energy Minerals Limited are both Australian-based companies involved in the exploration and development of mineral resources. Each focuses on specific minerals, with Metallica Minerals dedicated to delivering high-purity silica sand, while Evolution Energy Minerals concentrates on graphite through its Chilalo Graphite project in Tanzania. Both companies use their strategic projects to cater to international markets, capitalizing on Australia's rich mining industry infrastructure and expertise to develop and supply critical minerals.

GreenTech Metals Limited

Metallica Minerals Limited and GreenTech Metals Limited are similar as both are Australian companies engaged in the mineral exploration and development sector. Each company has a strategic focus on specific minerals; Metallica Minerals is focused on high-purity silica sand, whereas GreenTech Metals explores a variety of minerals including nickel, copper, zinc, gold, lithium, and cobalt. Both companies emphasize developing projects that cater to global markets, leveraging Australia's rich geological resources to supply essential minerals for various industrial applications.

Infinity Lithium Corporation Limited

Metallica Minerals Limited and Infinity Lithium Corporation Limited are similar as they are both Australian-based companies engaged in the exploration and development of mineral resources. Each company focuses on different minerals, with Metallica Minerals targeting high-purity silica sand and Infinity Lithium Corporation specializing in lithium, particularly in the production of battery-grade lithium hydroxide. Despite these differences in mineral focus, both companies operate with the common goal of exploring and developing strategic mineral projects, leveraging Australia's rich resources to meet global industrial demands.

Volt Resources Limited

Metallica Minerals Limited and Volt Resources Limited are Australian companies engaged in the development and exploration of mineral resources, though their focuses and geographical areas of operation vary. Both companies are involved in supplying materials crucial to industrial applications, with Metallica Minerals specializing in high-purity silica sand and Volt Resources focusing on graphite production and other critical minerals like lithium-borate, which are essential components in battery technology. Each company utilizes their strategic mineral projects to serve international markets, leveraging Australia's supportive mining infrastructure to expand their global footprint.

Zenith Minerals Limited

Metallica Minerals Limited and Zenith Minerals Limited are both Australian-based companies involved in mineral exploration and development, although they focus on different types of minerals and operate in varying regions. Metallica Minerals primarily focuses on high-purity silica sand, while Zenith Minerals explores a broader range of minerals, including gold, lithium, nickel, and various base and precious metals across Australia, Turkey, and Europe. Both companies are committed to leveraging Australia's rich mineral endowment to develop resources that can meet global demand, each operating with a strategy that emphasizes extensive exploration and project development.

Appendix E: Potential Dilution

We have set out below the potential dilution on our valuation of Metallica Minerals based on the funding required for the CFSS Project.

Notional Capital Raise	\$AUD
Source of Funding:	
Cash Balance	4,821,125
Other Working Capital Balance	(587,378)
\$100m debt funding	100,000,000
Total Funding Available	104,233,747
Funding Commitments:	
Equity funding for CFSS	142,020,000
Total Funding Commitments	236,700,000
Additional Funding Required	132,466,253

Potential Dilution Scenario	Scenario 1	Scenario 2	Scenario 3
No. of Shares	959.92	959.92	959.92
VWAP (2-month)	0.026	0.026	0.026
Funds Required	236.70	236.70	236.70
Equity Raising	132.47	132.47	132.47
Financing Discount/Premium	(25%)	0%	25%
Value Per Share	0.020	0.026	0.033
New Shares Issued	6,680	5,010	4,008
MLM Equity Value (Pre-money)	274.59	274.59	274.59
MLM Equity Value (Post-money)	407.05	407.05	407.05
Value per share before capital raising	0.286	0.286	0.286
Value per share after capital raising	0.053	0.068	0.082
Dilution	-81.37%	-76.16%	-71.35%

We cannot predict the trading price of Metallica Minerals in the future, however, we believe it is reasonable to assume that the 3rd scenario is most appropriate as the trading price is likely to increase as the company reaches milestones developing the CFSS Project. As such, we have applied a 70% dilution discount to the value of CFSS to account for potential future dilutionary effects to fund the project. While the project has reached a Definitive Feasibility Stage there are company specific risks that exist. We consider that calculating a dilution at the current market prices allows for the company specific risks at the current stage of the project. It is likely as the project progresses that these risks will reduce.



NORTHERN SILICA SAND PROJECT

ROCK WHARF CONSTRUCTION AND
PORT OF CAPE FLATTERY
JETTY EXTENSION

BASIS OF ESTIMATE

Document Number
E0533-BOE-001

Approvals

C	04/04/20243/05/24	PH	DS	ASDS
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LIMITATIONS:

~~This report has been prepared by PAEMAC for Advisory Partner and may only be used and relied upon by these parties. PAEMAC otherwise disclaims responsibility to any person or entity other than Advisory Partner arising in connection with this report.~~

The opinions, conclusions and recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of this report. Accordingly, PAEMAC cannot accept responsibility or obligation for events or changes to the site occurring after the date that this report was prepared.

Costs for addressing Works have been based on the outlined scope by Advisory Partner. Where work methodologies have been suggested in this report, these do not represent a full description of works required or the basis for a specification, i.e., they are only indicative of the type of necessary works.

The estimate has been prepared for the purpose of this study and must not be used for any other purpose. Actual prices, costs and other variables may be different to those used to prepare the Cost Estimate and may change. PAEMAC does not represent, warrant, or guarantee that the works can or will be undertaken at a cost which is the same or less than the Estimate.

Where estimates of potential costs are provided with an indicated level of confidence, notwithstanding the conservatism of the level of confidence selected as the works are at the planning stage, there remains a chance that the cost will be greater than the planning estimate, and any funding would not be adequate. Please contact PAEMAC if any information or clarification is required.

Photos used in this document have been sourced from the internet and other publicly available sources and have been included for illustration purposes only.

2 Purpose

DRX have produced a Study Document titled "Northern Silica Sand Project Scoping Study Summary" (June 2023). The Study Document details various costs associated with the project including the marine component. PAEMAC have been engaged by Advisory Partner Pty Ltd to review and provide an independent report (BoE) on the capital expenditure required to construct the marine component (only) of the DRX project which is the subject of the study document.

For the avoidance of doubt the marine component consists of those items detailed in Figure 2. This report details the assumptions and methodology used to develop the construction cost estimate for the marine component at Cape Flattery in Far North Queensland (Figure 1) namely:

- Construction of a new rock wharf; and
- Extension of the existing Port of Cape Flattery (PCF) shiploader jetty.

The PCF jetty is owned by Ports North (PN) and is operated by Cape Flattery Silica Mines Pty Ltd (CFSM). The existing PCF consists of a 220 metre, single trestle jetty and conveyor running from the mine to a 220m offshore berth and ship loader. There is also a general-purpose wharf for the import of fuel and other supplies for the mine and for the mooring of two line boats which assist in ship berthing.



Figure 1: Site Location

Construction of Rock Wharf and PCF Extension - Basis of Estimate

As indicated within the Study Document, the proposed new development will be undertaken in a staged approach (Figure 2):

- Phase 1 involves the construction of a rock wharf to the west of the existing PCF jetty with a conveyor and shiploader system outloading onto 8,500t transhipment barges. The rock wharf will also include a concrete roll on – roll off (RORO) facility to handle logistics for the mining operation. This is expected to have an outloading capacity of 3 million tons per annum (Mtpa).
- Phase 2 is the extension of the existing PCF jetty to allow for 55,000t bulk carriers to moor directly to the jetty and be loaded by shiploader. This phase is expected to have an outloading capacity of 5 Mtpa. The wharf extension will be constructed using piled foundations with a steel truss deck structure to support the conveyor system. Phase 2 is expected to commence operations 3 years after construction of Phase 1.

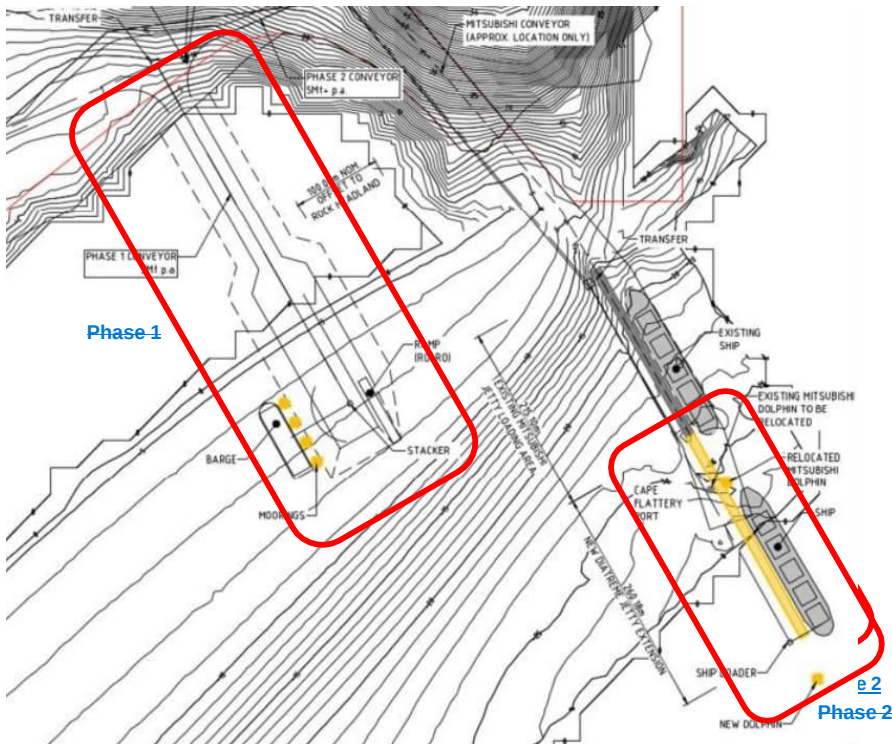


Figure 2: Site plan and general overview of phased construction approach

3 Terminology/Abbreviations

Table 1: Abbreviations

Acronym	Meaning
AUD	Australian Dollars
CAPEX	Capital Expenditure
Base Estimate	Estimated costs excluding contingency
BoE	Basis of Estimate
CFS	Cape Flattery Silica (Metallica Minerals)
CFSM	Cape Flattery Silica Mines (Mitsubishi Corporation)
Contractor	Contractor, Supplier
DRX	Diatreme Resources Limited
DWT	Deadweight Tonnage
EPCM	Engineering, Procurement and Construction Management
EWP	Elevated Work Platform
FEL	Front End Loader
GST	Goods and Services Tax
HAT	Highest Astronomical Tide
HLS	Heavy Lift Ship
LAT	Lowest Astronomical Tide
MOF	Material Offloading Facility
MSL	Mean Sea Level
Mtpa	Million tons per annum
MTO	Material Take-Off
OPEX	Operational Expenditure
PCF	Port of Cape Flattery
PN	Ports North
QLD	Queensland (AU)
RORO	Roll on Roll off
SEMP	Self-Elevating Modular Platform
SIMOPS	Simultaneous Operations
Study Document	Northern Silica Sand Project Scoping Study Summary (June 2023) by DRX
SOW	Scope of Work
TOS	Top of Steel
TSV	Trans-Shipments Vessel
WBS	Work Breakdown Structure

4 Estimate Scope

The Estimate is a Class 5 estimate in accordance with the principles of The Association for the Advancement of Cost Engineering (AACE) Cost Estimate Classification System – As Applied in Engineering, Procurement, and Construction for the Process Industries.

The construction estimate is based on the preliminary concept contained within the Study Document for the rock wharf and jetty extension and associated works (Figure 3). In developing this report, a number of assumptions have been made on methods, design and construction which is consistent with the class of estimate.

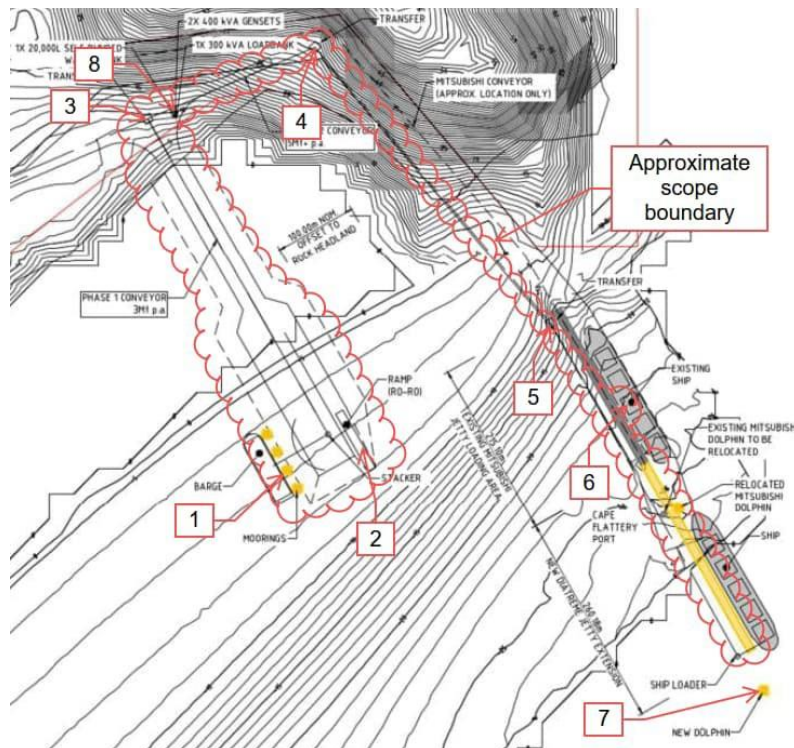


Figure 3: Scope of estimate

The scope of work is summarised as follows with reference to Figure 3:

- Phase 1: Construction of new rock wharf to the west of existing PCF jetty.
 - Transport of quarry fill material to site.
 - Construction of rock wharf.
 - Local winning of fill material.
 - Transport and installation of rock armour.
 - Construction of transshipment barge mooring [1].
 - Construction of concrete RORO facility [2].
 - Installation of conveyor back to the land side transfer tower, including transfer tower shown at [3]. This transfer tower forms the battery limit of material handling costing.
 - Reticulation of power and water from on-site generation and water storage/treatment [8].

Construction of Rock Wharf and PCF Extension - Basis of Estimate

- Extension of existing PCF wharf
 - Construction of new conveyor support trestle structure, incl. transfer towers [4, 5].
 - Relocation / replacement of existing dolphin [6].
 - Construction of wharf extension using piles and modular steel superstructure.
 - Construction of 1 x mooring dolphin [7].
 - Construction of 5 x berthing dolphins incl. fenders, bollards and quick release hooks.
 - Fabrication, delivery and commissioning of shiploader.
 - Reticulation of power and water from on-site generation and water storage/treatment [8].

The estimate includes direct costs to construct the Project under a Construct Only contracting model with the works expected to be completed by specialist contractors engaged directly by the Owner.

The estimate includes the direct costs to deliver the Works:

- Contractor preliminaries, mobilisation and demobilisation.
- Construction of shiploader jetty and dolphins using marine equipment.
- Supply and delivery of shiploaders.
- Land-based construction of abutments.
- Engineering design and support during construction.
- Temporary works and safe access platforms.
- Pre/post construction hydrographic survey.
- Contingency.

The estimate is based on the following inputs:

- Diatrema Resources ASX Announcement: Positive Scoping Study for Northern Silica Project strengthens development plans dated 14/06/2023.
- Diatrema Resources Northern Silica Sand Project Scoping Study Summary dated June 2023.
- Queensland Land Registry Sublease 718758708 dated 21/05/2018.
- As-built drawings CF-S-005(3), -022(3), 051(5).
- 2001 upgrade works as-built drawings 7681-(101 to 110).
- Email communication between dated 01/03/2024.
- Tide data from AusTides Cape Flattery (Australian Hydrographic Office).
- Maps from Queensland Globe (State of Queensland 2023).
- Ports North Annual Report 2022-23.
- Department of Transport and Main Roads Port Procedures and Information for Shipping - Ports of Cape Flattery, Cooktown and Port Douglas (January 2024).
- Ports North Long Term Maintenance Dredging Management Plan, Port of Cape Flattery.

Exclusions from the estimate include:

- Owner costs, including:
 - Project management and contract administration.
 - Working capital.
 - Operating costs.
 - Costs incurred due to losses in productivity during construction.
 - Finance and escalation.
 - Environmental approvals.
 - Sunk costs for studies or investigations.
- Dredging in any form.
 - Phase 1: Long length of rock wharf reaches water of sufficient depth for transshipment vessels (TSV).
 - Phase 2: Per Ports North document "Long Term Maintenance Dredging Management Plan – Port of Cape Flattery", "The natural deep-water location, and coastal hydrodynamics are sufficient mechanisms to avoid the need for maintenance dredging."
- Transshipment vessels, permanent cyclone moorings, offshore moorings, tugs and line boats.

Construction of Rock Wharf and PGE Extension – Basis of Estimate

- Approvals (environmental, state and/or federal).
- Access roads, haul roads, and supporting infrastructure.
- Demolition (other than the existing Mitsubishi mooring dolphin)
- Site rehabilitation or remediation.
- Removal of Phase 1 rock wharf after completion of Phase 2.
- Land side feed conveyors outside of the scope boundary shown in Figure 3
- Power generation and water storage/treatment (assumed hired and maintained as OPEX cost).
- Land side utility infrastructure (electricity, water, communication, etc.) outside of the scope boundary shown in Figure 3.
- Escalation.

5 Construction Methodology

5.1 Assumptions

The following assumptions were made during the build-up of the methodology:

- The new wharf extension is accessible by a heavy lift ship (HLS).
- While there is a 4x4 track to the site, all construction plant and materials are to be brought in by landing craft and barges.
- 1/3rd of the fill material for the construction of the rock wharf will be imported from commercial quarry operations near Cairns, while the remaining 2/3rds of core materials will be won locally from borrow pits.
- Rock wharf batter slope was assumed to be 1:1.5.
- No sealing (asphalt/concrete) would be installed on the rock wharf top surface. A capping layer of 0.5m thick imported rock has been included.
- Provision has been made for accommodation for Contractor's workforce on or near to site.
- Camp and office accommodation mobilized to site via landing craft ex. Cairns.
- Staff will fly in and out via helicopter (noting use of existing airstrip is not possible, and transit times via vessel too long).
- Battery limits as per boundary indicated in Figure 3.
- The shiploader in Phase 1 was assumed to be purchased and retain 50% of its value for resale after three years.
- No allowance was made for the removal of the rock wharf and/or conveyor system (Phase 1) after Phase 2 comes online.
- Nil provision for nightshift construction works.
- Nil provision for escalation.
- No legislative impediments to construction (such as environmental license conditions).
- Labour, staffing and plant costs based on 2024 rates for resource project works.
- Working calendar assumed at 2 in 1 roster & 7 working days per week.
- Provision included for fuel at \$2.10/litre.

5.2 Site Constraints

5.2.1 Access

Road access to the site is understood to be limited to a 4x4 track. For this reason, all material delivery will take place via water, with marine plant being mobilised from Cairns or Townsville.

Land-side plant for the construction of the rock wharf (e.g., articulated dump trucks, excavators, front-end loaders) would also need to be mobilised via water, likely via landing barge. A temporary facility will need to be constructed for the first delivery of earthmoving equipment (Figure 5 and 5).

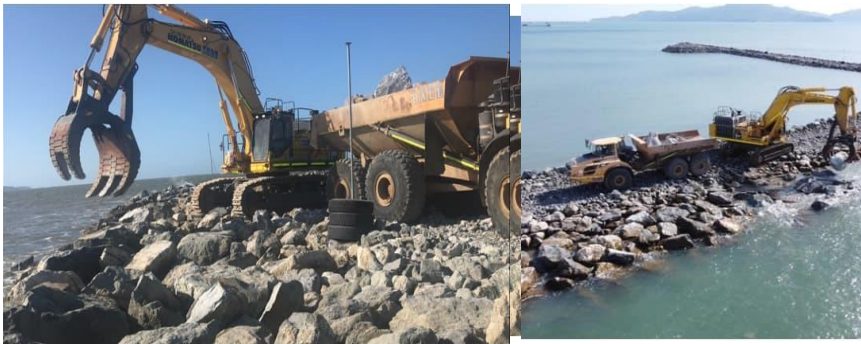


Figure 4: Construction of the offloading facility



Figure 5: Temporary barge offloading facility

Delivery of the wharf extension modules and shiploader will be via Heavy Lift Ship (HLS) (Figure 6).



Figure 6: Modular wharf construction using HLS

[Construction of Rock Wharf and PGE Extension - Basis of Estimate](#)

All crew will be flown in and out via helicopter (Figure 7) operating from a temporary helipad, carrying 6 crew per flight.



Figure 7: Helicopter used for crew transfer to and from site

5.2.2 Water Depth

Construction of Rock Wharf and POE Extension – Basis of Estimate

Water depth at LAT along the existing wharf increases from 17m at BD-5 to 24m at MD-1. Depth at the outermost tip of the rock wharf was taken at 8m at LAT.

5.2.3 Tidal Range

The maximum tidal range is 3.0m, but 95% of the daily variation should fall within twice the standard deviation, between 0.34m and 2.57m above LAT (Figure 8).

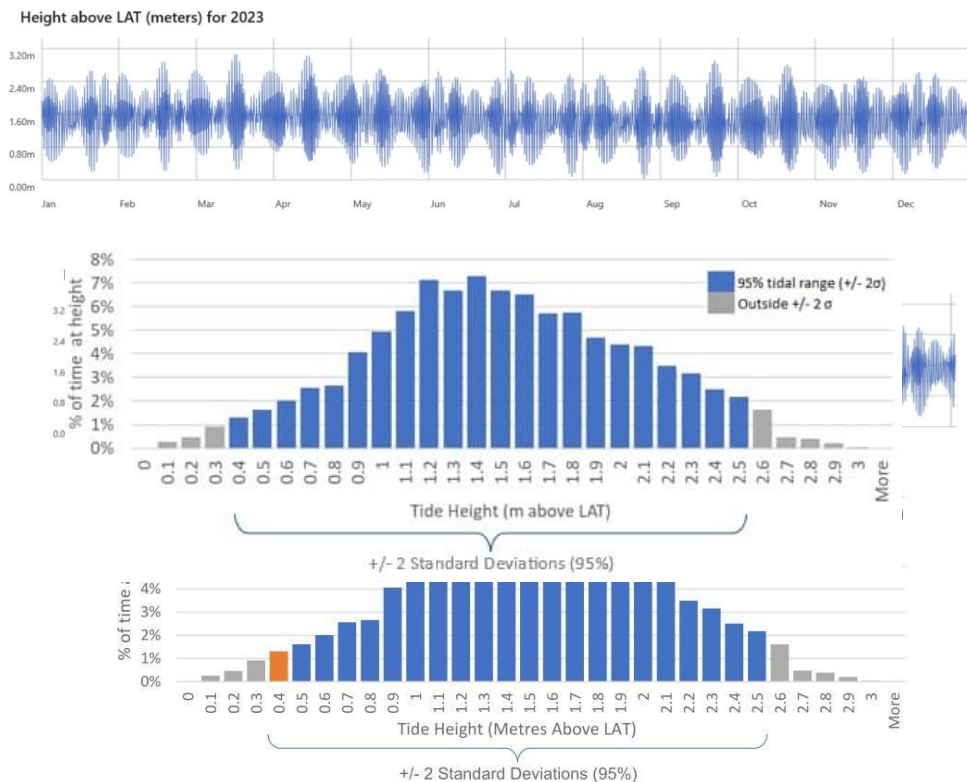


Figure 8: Forecast tidal range for Cape Flattery, 2023. Metres above LAT (0m LAT = 0m CD) (Source: AusTides, Australian Hydrographic Office)

5.2.4 Cyclones and Weather

The site falls inside the eastern cyclone zone, with the season typically running from November to April, although tropical cyclones can and do occur outside of this period. The long-term average number of-

Construction of Rock Wharf and PGE Extension - Basis of Estimate

tropical cyclones in this zone using data from 1969-2022 is 4, with a 76% chance of fewer storms occurring (source: BOM Australian Tropical Cyclone Outlook for 2023-24). Provision of cyclone moorings for all marine construction plant on site during this period would be required.

The local prevailing wind direction is SE (37.82%) followed by SSE (26.26%) (5-year data from WillyWeather Cape Flattery), indicating that the site is exposed to the prevailing wind. Local annual wind speed data also suggests less weather loss would be experienced between October and March (Figure 910). However, this does coincide with cyclone season, so stand-down allowance and suitably rated moorings would need to be included. Previous project experience under these conditions suggests a 15% weather loss is to be expected (averaged over a continuous year). This represents time lost due to a combination of poor weather and seastate caused by rain, wind, swell, waves and other adverse conditions.



Figure 99: Prevailing wind direction, 2022
(Source: WillyWeather Cape Flattery)

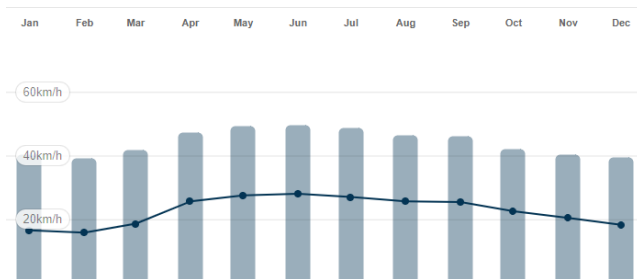


Figure 10: Max and average wind speed, 2013-23 average
(Source: WillyWeather Cape Flattery)

5.3 Project Schedule

The estimate has been aligned with a high-level schedule of works based on a working calendar of a 2 in 1 roster with 7 working days per week.

Phase 1 construction of the rock wharf has been assumed to take 50 weeks on site from mobilisation to completion (not including any preliminary works and/or procurement).

Phase 2 construction has been assumed to take 60 weeks on site from mobilisation to completion (also excluding any preliminary work and/or procurement).

5.4 Phase 1 - Transhipment Facility

5.4.1 Rock Works

The proposed rock wharf is 450m long and 35m at the apron, extending into water depths of approximately 8m below LAT (Figure 4.9.11) with dimension interpolated from the Study Document. The wharf is assumed to consist of a crushed rock core, protected by geofabric followed by filter and armour rock layers (Figure 4.11.12). The assumed fill specification consists of 1/3rd imported rock fill material, and 2/3rds sand material locally won on site (Figure 4.2.13). The outer primary and secondary armour material is assumed as all imported. Provision was made in the estimate for a surveyor and an on-site laboratory for QA/QC during construction.

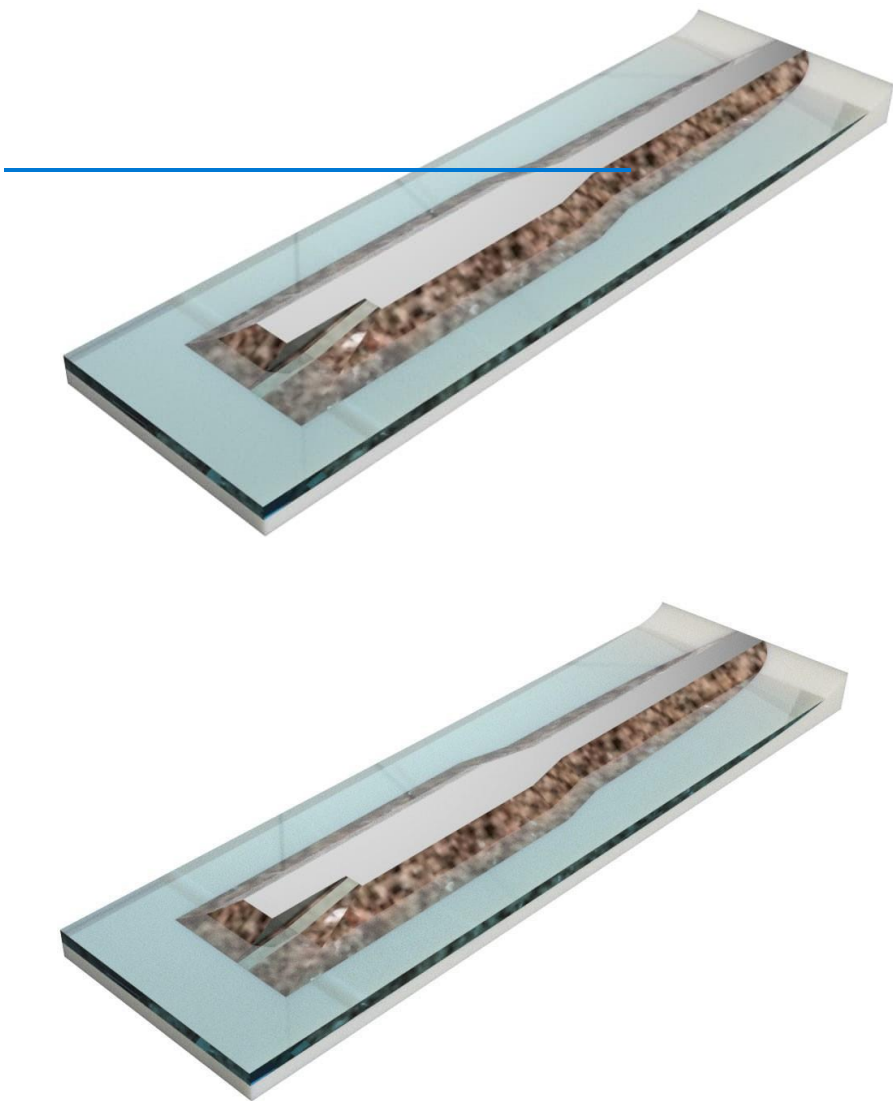


Figure 1011: Interpolated approximate layout for rock wharf. Tide shown at LAT.

Construction of Rock Wharf and PGE Extension - Basis of Estimate

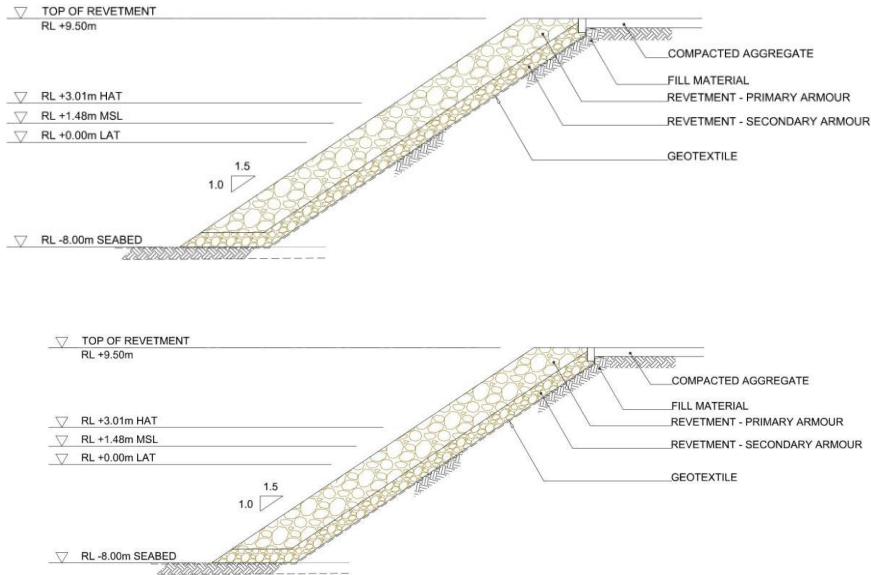
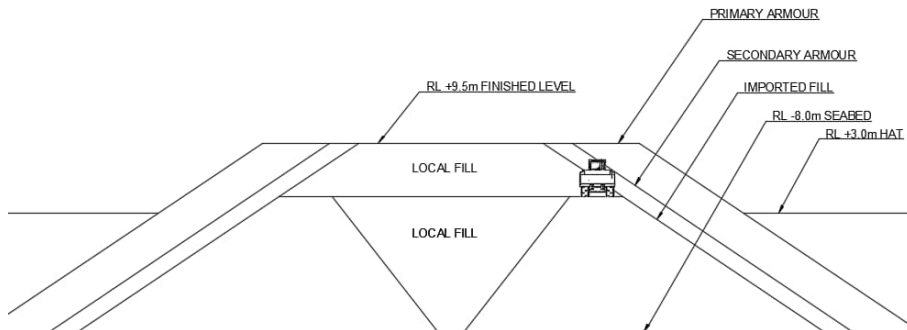


Figure 1412: Assumed cross section of wharf construction showing fill and armour



Construction of Rock Wharf and POE Extension - Basis of Estimate

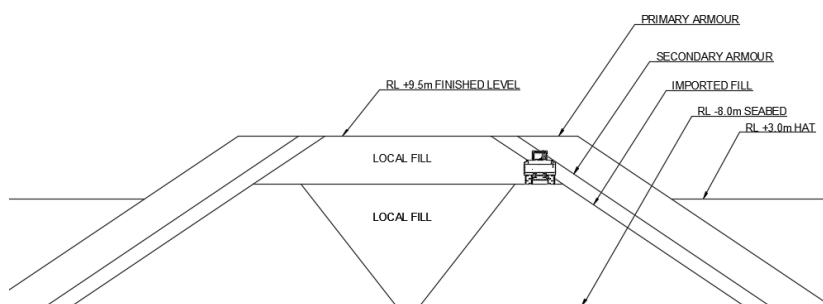


Figure 1213: Assumed cross section of rock wharf illustrating proposed construction methodology

Construction of Rock Wharf and PGE Extension - Basis of Estimate

Imported materials will be brought in on rock barge from Cairns using 4 x rock barges, each bringing 2500t - 5000t to site per load (Figure 1314). These barges would likely need to be sourced from Singapore. A temporary loadout facility will need to be constructed from locally won materials to enable offloading of rock barges. A small landing craft would be used to offload plant to create the loadout facility and a temporary helipad. As an indication of the complexity of this operation, this equates to over 120 barge loads of rock materials.



Figure 1314: Typical rock barge being loaded by front-end loader

It is noted that the Phase 1 rock load out concept would benefit from significant design refinement and value engineering. The quantity of rock to be imported, coupled with the remote, environmentally sensitive location means construction costs are significant. Without specific design details for Phase 1 assumptions have been used to develop the basis of costing. The site is exposed to prevailing weather conditions and susceptible to both erosion and coastal processes. No outer breakwater, overtopping protection or revetment structure has been indicated as required within the Study Document, however without protection from seastate, vessels using the facility are susceptible to the prevailing site conditions. As such no additional provisions for seastate protection have been considered within the BoE.





Figure 4.15: Typical rock barge being offloaded by front-end loader

Construction of the wharf is completed by creating two bunds of imported crushed rock material (imported to ensure quality). These bunds are pushed out from landside using a combination of front- end loaders (FEL), excavators and articulated dump trucks. The bunds are then filled in and the entire wharf brought to final height using locally won sand material to limit the quantity of imported material. Once the core has been completed, it is covered by geofabric followed by a layer of secondary armour

rock. Finally, a layer of appropriately sized armour rock is installed. The top surface of the rock wharf consists of compacted aggregate, with compaction achieved using a pad roller.



Figure 1516: FEL, excavator and dump truck working to place fill for typical armoured rock wharf





Figure 16: Installation of geofabric on top of fill



Figure 17: Installation of geofabric on top of fill



Figure 18: Installation of primary and secondary rock armour on top of geofabric

5.4.2 Transhipment Berthing Structure

The single TSV berth will be constructed on the western edge of the rock wharf. It was assumed to follow the structure of a similar facility (Figure 4.8.19) suitable for 8,500 DWT self-propelled barges. The berth will consist of 4 vertical piles braced back to the rock wharf with struts, anchored into the wharf via concrete blocks. Fenders will be mounted to the front face of the vertical piles.





Figure 1819: Reference transhipment barge berth

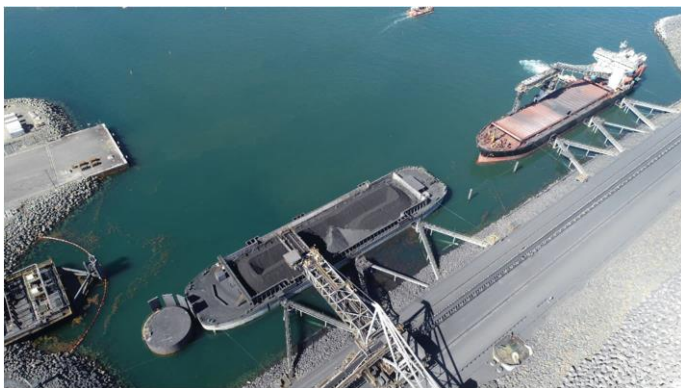


Figure 1920: Reference transhipment barge mooring structure

Installation of the 4 mooring piles would be completed using a piling frame mounted to a Self-Elevating Modular Platform (SEMP) (Figure 2021). The frame is fully manoeuvrable and is fitted with two installation gates which secure the pile in location and ensures the pile is installed within construction tolerances.

The land-side concrete works necessary for anchoring the struts will be completed using a small concrete batch plant (Figure 2122). Struts will be installed using a crane mounted on the SEMP, in conjunction with an Elevated Work Platform (EWP) and a access systems attached to the piles.



Figure 2021: SEMP used to install mooring piles.



Figure 2422: Small mobile concrete batch plant

5.4.3 Landing Ramp

The concrete landing ramp extends from the southeastern corner of the rock wharf for access by RORO vessels or landing craft. The ramp is constructed in-situ. The ramp is required to allow additional port logistics access for mining operations which has been interpreted to mean a RORO vessel capable of vessel-to-shore transfer of track and wheel mounted mining equipment as listed in Table 4-3 of the DRX Scoping Study.



Figure 2223: Landing ramp for RORO vessel or landing craft

5.4.4 Shiploader

The shiploader is assumed to be a radial type with an extendable boom for TSV loading (Figure 2324). The conveyor will feed to the shiploader pivot hopper before being loaded onto the barge. The shiploader was assumed to be purchased for the Phase 1 period (i.e. 3 years) and sold at 50% value upon completion of the Phase 2 works.

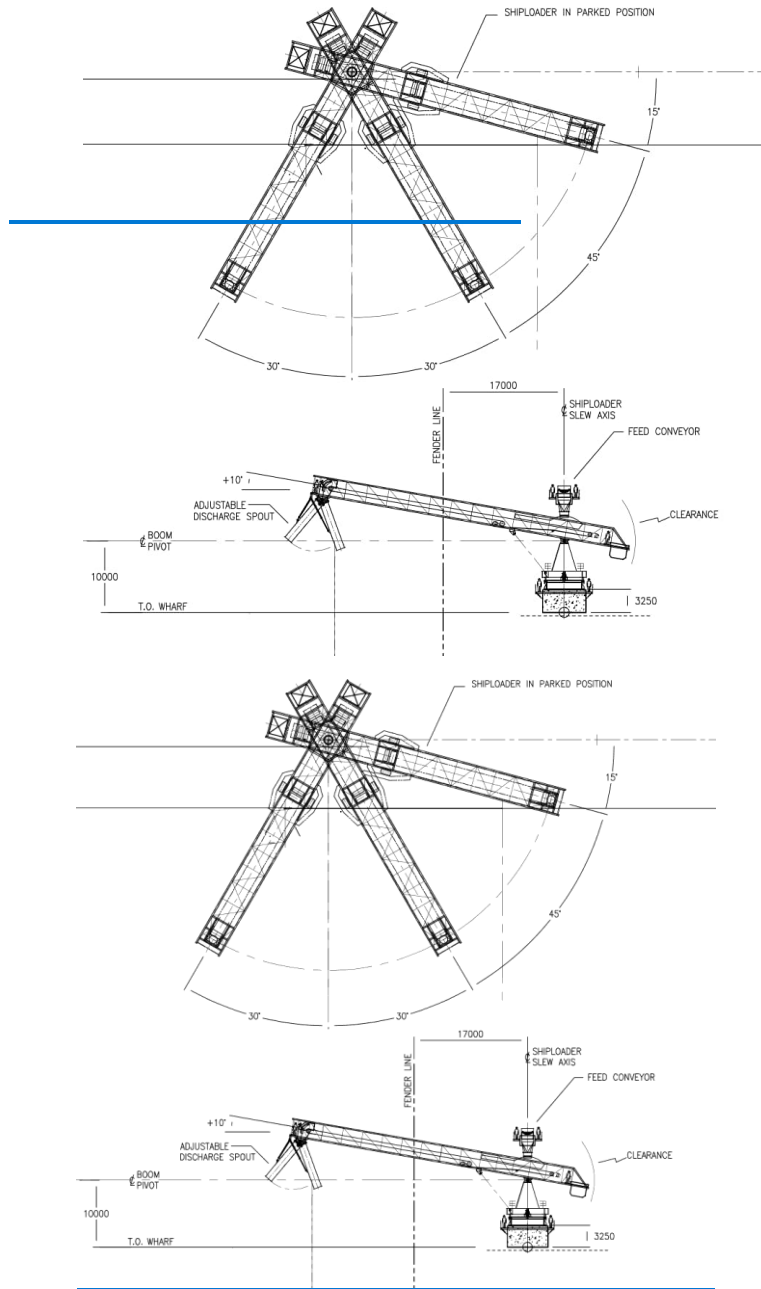


Figure 2324: Typical radial shiploader for barge loading

5.4.5 Site Office and Camp Facilities

A construction camp in the vicinity of the construction site (Figure 2425) has been included in the estimate for the full Phase 1 construction duration (Table 2). These facilities are on site for the full Phase 1 construction duration. All facilities are mobilised to site using a landing craft ex. Cairns (Figure 2526) onto the temporary loadout facility.



Figure 2425: Typical construction camp using transportable buildings

Table 2: Breakdown of temporary site office and camp facilities

Site Facilities	Description	Quantity
Main Office	12X6 -Office	1
Cribs	12X3 -Cribs	2
Toilet	Toilet	2
Access Stairs	Access -Stairs	1
Water Tanks	5000l Water Tanks	2
Waste Tanks	5000l Waste Tank	1
Water Pumps	Pumps (incl. UV filter)	2
Power	50Kva Genset	1
Diesel	2500l Diesel Tank	1
Bunded Fuel Storage	Fuel Tank Bund & Pump	1

Camp Facilities	Description	Quantity
Accommodation	4 Bed Ensuite	8
Bathrooms	General	4
Kitchen	Commercial	1
Refrigeration	20ft Container	1
Dry Stores	20ft Container	1
Maintenance Store	20ft Container	1
Luggage Store	20ft Container	1
Laundry and Line Store		1
Rec. Room/Wet Mess		1
Gym		1
Office	12X6 -Office	2
Waste Water Treatment Plant		1
Water Storage Tanks	5000l Water Tanks	2
Elec Generator Package	50Kva Genset	1
Diesel	2500l Diesel Tank	1





Figure 2526: Typical landing craft used for camp mobilisation and on-going weekly supply

5.5 Wharf Extension

The Port of Cape Flattery wharf extension necessary for Phase 2 of the project is assumed to be constructed using a modern modular philosophy, with piles being installed and braced prior to delivery and installation of pre-made deck modules. Once installed and shiploader rails aligned, the shiploader can be delivered and commissioned. The feed conveyor will require a separate structure due to lack of space on the existing wharf.

5.5.1 Piling

Piling will be completed using a SEMP equipped with crane and piling frame (Figure 2627). The SEMP will work in conjunction with a storage barge and a Multicat style workboat. The water depth and likely pile size suggest the SEMP will need to have a capacity of 500t approximately.



Figure 2627: Pile top drill rig and piling frame mounted to SEMP

Piling will be completed using the "drive, drill, drive" (DDD) piling technique consistent with the methods used previously in constructing the existing PCF wharf (Figure 2728). This method is used in situations where conventional pile driving methods might encounter challenges such as hard soil or bedrock. This method was assumed to be necessary due to the low pile penetrations noted in the "Berthing Dolphin Upgrade" drawings ($\pm 3\text{m}$). This technique involves a three-step process:

1. **Drive:** Initially, the pile is driven into the ground using a hydraulic or vibratory hammer. This initial driving phase aims to penetrate the soil or soft rock layer to a certain depth. Once the pile reaches a layer that cannot be penetrated effectively using conventional driving methods, the process moves to the next step.
2. **Drill:** In the second stage, a drill rig is used to create a borehole or pilot hole into the hard layer of soil or rock. This drilling process involves using drilling equipment mounted to the pile top (Figure 2728), to penetrate the hard layer. The borehole is typically slightly wider than the pile diameter to allow for easy insertion of the pile.
3. **Drive:** Once the borehole is drilled to the desired depth, the pile is inserted into the hole. The pile is then driven further into the ground using pile driving equipment. This driving phase ensures that the pile is securely seated within the drilled hole, providing the necessary stability and load-bearing capacity for the construction project.

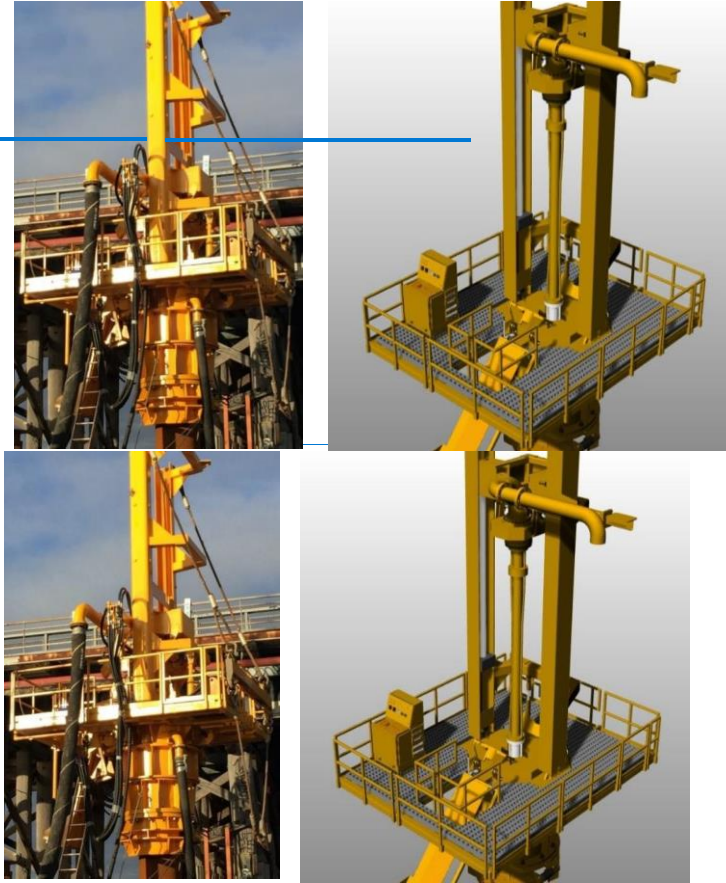


Figure 2728: Pile top drill rig used for DDD pile installation

Wharf piling is expected to take 24 weeks to install the wharf piles. Following completion of the piling, the piles will be braced using temporary bracing, and walkways installed to allow for pile top access (Figure 2829).



Figure 2829: Pile bracing and walkways installed

5.5.2 Mooring Dolphin Relocation

In order to mitigate the disruption caused by the relocation of the Mitsubishi dolphin on current Port operations, a new dolphin structure has been budgeted for. This facilitates a faster transition between using the existing dolphin to the new dolphin upon its completion and minimises impact on existing shipping operations. Subsequently, the old dolphin can then be dismantled and removed, with the piles cut at the seabed level. However, due to the location, construction of the new dolphin will still be impacted by shipping operations, necessitating the periodic relocation of the SEMP to accommodate the passage of incoming and outgoing vessels, as discussed in Section 13: Interaction with Existing Port Infrastructure and CFSM Operations.

Allowance was made for 50% of the assumed 6 raked piles (based on existing dolphin, Figure 2930) to be anchored, with the remaining 50% to be installed using the DDD technique. This was based on the limited pile penetration during construction of the main PCF wharf. Following installation of the 6 piles, the pile caps and headstock can be installed prior to the installation of the dolphin deck and mooring bollards/quick release hooks. Furniture such as handrails and ladders can then be installed.

Construction of Rock Wharf and PGE Extension – Basis of Estimate

The new mooring dolphin as well as the 5 x new berthing dolphins will be completed using the same methodology. The mooring and berthing dolphins need to be completed prior to the arrival of the HLS to allow it to moor safely.



Figure 2930: Mooring dolphin structure consisting of 6 raked piles

5.5.3 Deck Installation

The 5 x prefabricated deck modules will be delivered to site on an HLS, which will be berthed using the newly constructed mooring and berthing dolphins (Figure 3031). The deck modules can then be lifted into position using the HLS cranes before being aligned and fully welded.



Figure 3031: HLS transporting prefabricated modules



Figure 3432: HLS installing prefabricated deck modules

5.5.4 Conveyor (Marine)

The existing PCF access jetty and roadway does not have sufficient space to install an additional conveyor (Figure 3233), and as such a new conveyor structure is required and is expected to approximately follow the red line shown (Figure 3334). Allowance was made in the estimate for construction of a new piled trestle parallel to the existing jetty (Figure 3435). This red line conveyor may be similar to the smaller conveyor jetty shown closer to land (used by Mitsubishi). Piles will be installed using the same technique as the wharf extension, albeit using smaller piles. The conveyor structure will be brought in as modules on the same HLS used to transport the deck modules.



Figure 3233: Lack of space on existing conveyor structure for a second conveyor.

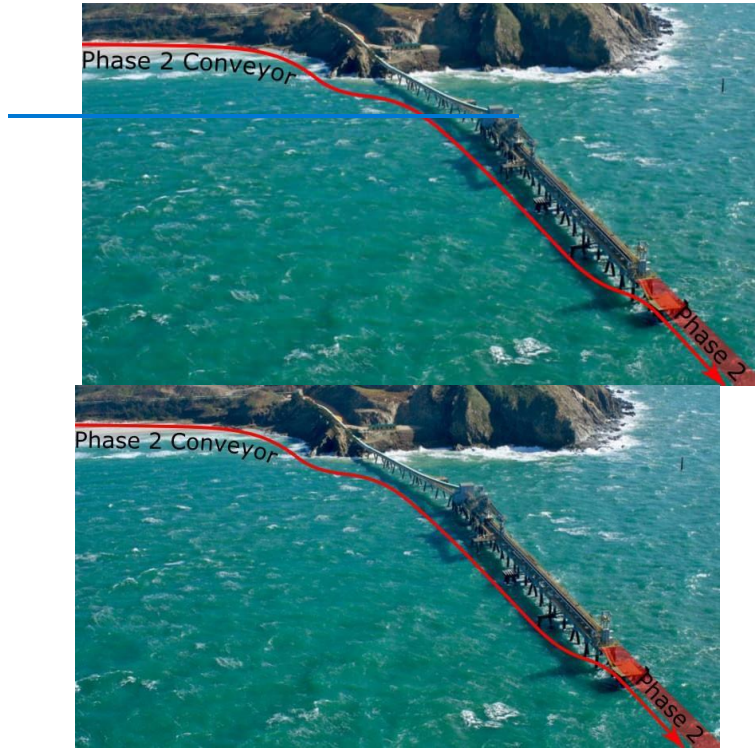


Figure 3334: Potential location for Phase 2 conveyor





Figure 3435: Concept for additional conveyor parallel to jetty structure

5.5.5 Conveyor (Landside)

Simply supported reinforced concrete footings have been assumed to be suitable for the purposes of supporting the landside conveyor.

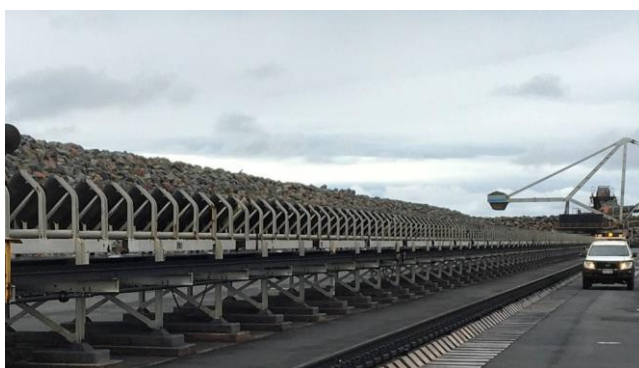
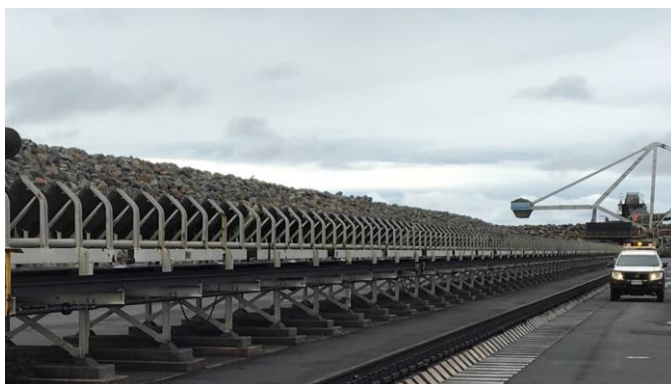


Figure 3536: Concept conveyor on footings feeding radial shiploader to TSV

5.5.6 Shiploader

The shiploader will be designed and built offshore specifically for the application. The entire shiploader will be brought in as a complete unit on an HLS and lifted directly onto the rails on the deck using the HLS cranes (Figure 3637).



Figure 3637: HLS lifting a fully assembled shiploader

6 Estimate Basis and Methodology

6.1 Estimate Basis

The Cost Estimate is:

- Developed to produce an AACE Class 5 Capital Cost Estimate (Figure 3738).
- Based on an Owner-led direct execution framework.
- Based on basic layout as illustrated in Diatrene Resources Northern Silica Sand Project Scoping Study Summary (Study Document).
- Estimate base date is Q1, 2024.
- Expressed in Australian Dollars.
- Exclusive of GST.

ESTIMATE CLASS	Primary Characteristic	Secondary Characteristic		
	MATURITY LEVEL OF PROJECT DEFINITION DELIVERABLES Expressed as % of complete definition	END USAGE Typical purpose of estimate	METHODOLOGY Typical estimating method	EXPECTED ACCURACY RANGE Typical variation in low and high ranges at an 80% confidence interval
Class 5	0% to 2%	Functional area, or concept screening	SF or m ² factoring, parametric models, judgment, or analogy	L: -20% to -30% H: +30% to +50%

Figure 3738: Class 5 estimate (Source: 56-08R AACE Cost Estimate Classification System)

6.2 Estimate Methodology

The estimate methodology uses:

- Quantities estimated from drawings and dimensions provided and built-up using knowledge of the construction methodology and modern wharf design philosophies.
- Direct workhours based on first principles build-up of crews and production cycles.
- Labour crew rates developed using a marine contractor's labour agreement.
- Contractor distributables determined from first principles and estimated based on durations.
- Labour, plant and equipment based on market rates and recent budget quotations.
- A contingency allowance of 30% has been adopted.

6.3 Estimating Software

The estimating software used to develop the Estimate is Expert Estimation.

7 Estimate Summary

The capital cost estimate for each project phase is summarised below with complete detail attached in the Estimate Report (see Appendix A. Estimate Submission Schedule and Summary).

7.1 Phase 1 – Rock Wharf

Table 3 outlines the financial breakdown for Phase 1, detailing both direct and indirect costs in AUD. Direct costs encompass contractor preliminaries, rock works, marine structures, and product handling, totalling \$107,200,000. Indirect costs, including engineering and temporary facilities, amount to \$16,100,000. Additionally, a contingency provision of \$37,000,000 is allocated, bringing the total project expenditure to \$160,300,000. The project cost breakdown is illustrated in Figure 38.

Table 3: Phase 1 Estimate Summary

Phase 1 Transhipment Facility	Amount (AUD)
Direct Costs	
Contractor Preliminaries	\$23,100,000
Rock Works	\$64,700,000
Marine Structures	\$5,600,000
Product Handling	\$13,800,000
Indirect Costs	
Engineering	\$3,800,000
Temporary Facilities	\$12,300,000
Contingency	
Contingency Provision	\$37,000,000
Total	\$160,300,000

7.2 Phase 2 – Wharf Extension

The Phase 2 estimate is summarised in Table 4, detailing direct and indirect costs, as well as contingency in AUD. Direct costs include contractor preliminaries, berthing and mooring dolphins, the jetty extension, approach jetty structure, product handling and loadout, and services, totalling \$169,200,000. Indirect costs, encompassing engineering and temporary facilities, amount to \$12,500,000. Additionally, a contingency provision of \$54,500,000 is included bringing the total project expenditure to \$236,200,000.

Table 4: Phase 2 Estimate Summary

Phase 2 Wharf Extension	Amount (AUD)
Direct Costs	
Contractor Preliminaries	\$44,900,000
Berthing and Mooring Dolphins	\$19,500,000
Jetty Extension	\$35,700,000
Approach Jetty Structure	\$13,400,000
Product Handling and Loadout	\$42,600,000
Services	\$13,100,000
Indirect Costs	
Engineering	\$5,900,000
Temporary Facilities	\$6,600,000
Contingency	
Contingency Provision	\$54,500,000
Total	\$236,200,000

Construction of Rock Wharf and PCF Extension – Basis of Estimate

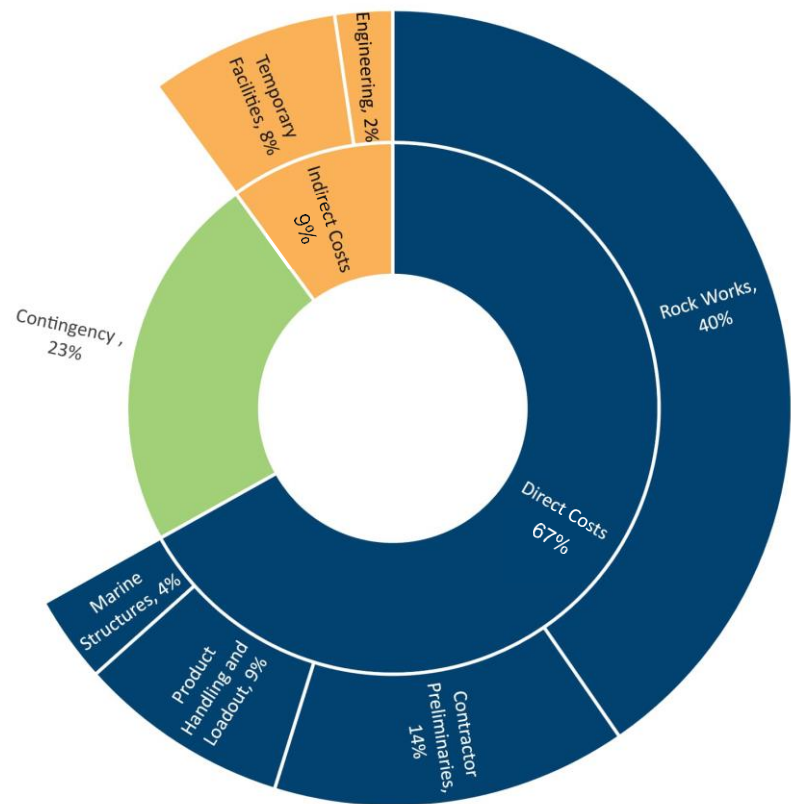


Figure 3839: Phase 1 estimate breakdown

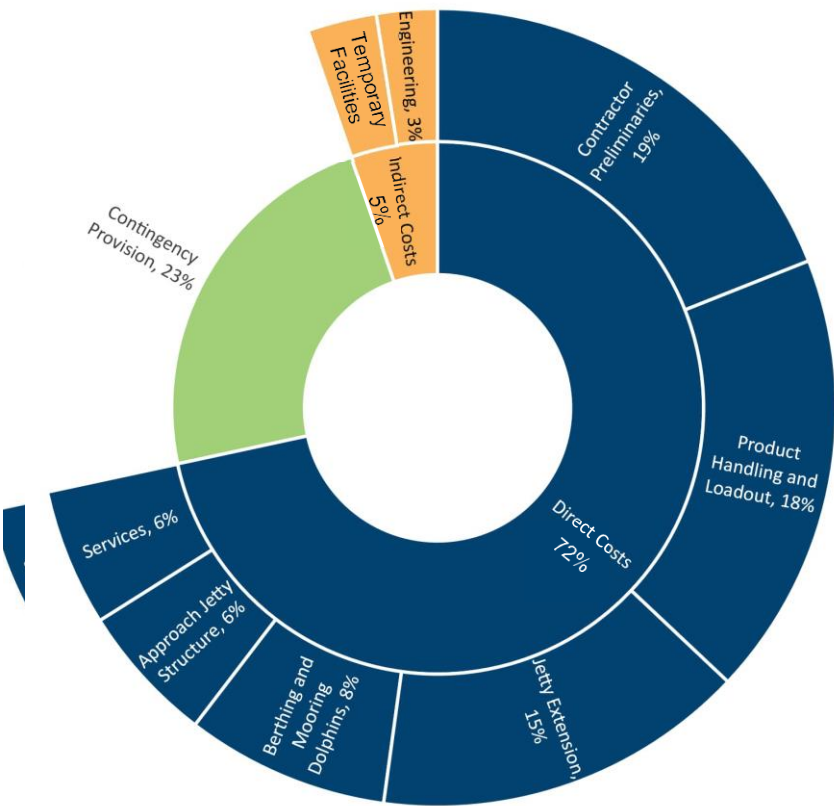


Figure 3940: Phase 2 estimate breakdown

8 Direct Costs

8.1 Quantity Development

The general approach to the estimate quantification and scope has been:

- Construction scope has been quantified from the details referenced within this report.
- Quantities inferred from concept drawings and reference to other projects.
- Landside conveyors and abutment construction has been assumed as no detail has been supplied.
- Quantities were expressed measured neat in place. The estimate makes additional allowances for sundries and waste.

8.2 Pricing Development

Table 5 outlines the source of pricing for key resources.

Table 5: Estimate cost basis

Discipline	Description
Marine plant	Database rates from recent projects Q12024.
Cranes and support equipment	Database rates from recent projects Q12024.
Construction costs, equipment and labour	First principles cost estimate based on resource costs applied against schedule of works. Productivity rates are from PAEMAC database and recent marine projects with losses allowed for weather and interface.
Construction materials	Database rates from recent projects Q12024. First principles cost estimate based on estimated quantities.
Contractor Preliminaries	First principles cost estimate based on resource costs applied against schedule of works.

8.3 Site Labour

8.3.1 Labour Rate

Labour rates were calculated using a representative Enterprise Agreement for a marine contractor for FIFO work in rural Queensland.

Calculations are based on an average 84-hour week with 12-hour day x 7 working days / week.

These base rates include site allowances, location allowance, long service leave, annual leave, sick leave, leave loading, public holidays, payroll tax, workers compensation and shift allowance.

The labour cost rate in the estimate includes the costs for:

- Flights (based on industry standard charter rates)
- Accommodation and meals (Phase 1 based on mobilisation/demobilisation and industry standard 30-person mobile camp for similar accommodation. Phase 2 based on use of existing mine camp).

8.3.2 Site Construction Work Hours

The daily output of each crew is determined using task durations completed during an effective day calculation. The effective day has been reduced to reflect the restricted access to the worksite and accounts for daily losses due to prestart toolbox talks and breaks.

8.4 Contractor Distributable Costs

The following items are directly calculated and allocated by task and duration to the specific line items within the Work Breakdown Structure:

- Contractors Project Management.
- Supervision.
- Insurance, guarantees and corporate indirects.
- Temporary facilities (office, crib and ablutions).
- Mobilisation and demobilisation.
- Construction plant and equipment.
- Indirect labour.
- Task specific and general craneage.
- Small tools and consumables.

The following indirect Contractor costs are distributed throughout the estimate and spread as a percentage across the calculated direct costs:

- Contractor's overheads and profit.
- Expected weather losses.

8.5 Owner Supplied Items

Supply items that have been identified as Owner supply and assumed free issue to Contractor:

- Land for Contractor laydown area, temporary camp and land-side access to site.
- Management of or integration with any PCF operations to provide Contractor access for Phase 2 Works.

These items are excluded from the Cost estimate. All other temporary, permanent materials and services required to undertake the Works are to be provided by Contractor.

8.6 Freight and Transportation

All materials (incl. waste) within the direct costs include transport from Port of Cairns, QLD.

Allowance has been included in the estimate for costs to transport plant and equipment between site and Port of Cairns, QLD using a combination of landing craft and towed barges.

8.7 Growth Allowance

Growth allowance considers changes to both quantity and cost to cover unknown but expected increases.

Growth allowance has been excluded in the assessment.

9 Indirect Costs

9.1 Engineering Design

Engineering costs associated with the construction works, including design, construction support, lift studies and design of temporary works have been included as Engineering Design and Support. This was calculated as 3.5% of the direct costs.

9.2 Owners Costs

Owner's costs have been excluded from this Estimate. These can include, but are not limited to:

- Permits and Statutory Approvals.
- Owners project procurement and management team.
- Corporate Management.
- Loss of operations, asset, revenue and profit associated with construction of the Works.

9.3 Goods and Services Taxes

Goods and Services tax has been excluded from the Estimate.

10 Contingency

Contingency is an allowance for uncertainty and risk in the estimate to cover undefined items of work that must be performed, or to cover elements of cost within the defined scope of the estimate that cannot be explicitly foreseen or identified at the time the estimate is being developed. The Class 5 estimate includes a Contingency allowance of 30%.

Key risk factors contributing to the contingency are summarised below:

- Specialist Contractor and plant scarcity.
- Site delays, including plant breakages and equipment failure.
- Weather and seastate.
- Staff and labour scarcity impacting cost and / or progress of the Works.
- Approval conditions and restrictions to work methods.
- Remote location.

11 Escalation

Escalation analysis is required to determine the amount of money necessary to compensate for cost increases due to occur from the base date of the estimate to the date of project completion.

Escalation has been excluded from the estimate.

12 Estimate Reviews

The following estimate reviews have been performed:

- Estimating internal review.
- Peer review for Client submission.
- Benchmarked against similar projects, making allowance for:
 - The Phase 2 construction location necessitates drilling and anchoring of piles, which is more costly than traditional piling.
 - The PCF location is remote and largely inaccessible from land, necessitating the transport of all construction plant, materials and temporary supporting infrastructure via sea, increasing costs.
 - Complex conveyor system with multiple transfer towers and additional supporting infrastructure required for Phase 2 increasing costs.

13 Interaction with Existing Port Infrastructure and CFSM Operations

Interaction issues with the existing Cape Flattery Silica Mine's (CFSM) infrastructure during construction will be unavoidable, noting the proximity of the construction to CFSM's wharf and the requirement to move the Mitsubishi mooring dolphin. The main risks associated with construction and operations interface are:

- 1) Phase 1 transhipping to bulk carriers moored at existing wharf.
- 2) SIMOPs interaction between Phase 2 construction and CFSM vessels.
- 3) Port operations following completion of Phase 2 construction.
- 4) Removal / relocating of the existing Mitsubishi mooring dolphin.
- 5) Parting mooring lines.

Phase 1 transhipping to bulk carriers moored at existing wharf

In the description of the Phase 1 operational concept, the DRX scoping study summary states that "The product will then be transhipped to bulk carriers anchored at the existing wharf".

The existing conveyor outloading capacity of 1300 t/hr¹ and average vessel capacity (52 264t) suggests that vessels will be on berth for 3 days (including arrival and departure times). Transfer from barge to moored vessel would therefore need to exceed a gross outloading capacity of 1300t/hr in order for the berth to have sufficient capacity (without impacting on current operations). Specific outloading capacity will need to be significantly higher to allow for TSV loading and turn-around time. Key risks would be:

1. Interaction/coordination with existing operations and management of shipping operations.
2. Operational capacity of TSV(s) and rate of transshipment outloading operations.
3. Weather limiting transshipment operations and TSV movement.
4. Capacity of existing dolphins to accommodate simultaneous mooring of bulk- and transshipment- vessels.

SIMOPs interaction between Phase 2 construction and CFSM vessels

Per Department of Transport and Main Road document Port Procedures and Information for Shipping, Ports of Cape Flattery, Cooktown and Port Douglas, "There are no tugs at the port. Ships anchors will be used extensively to assist berthing and unberthing."

The existing PCF approach (Figure 4041) and lack of tugs available means the construction area for the Phase 2 extension is directly in the path of incoming vessels. This would likely mean that all construction activities would need to be coordinated with the shipping schedule to ensure the SEMP is not endangered by an approaching vessel. 2023 saw 58 vessels berth at Cape Flattery², averaging slightly more than 1 per week. This would likely have a significant impact on construction productivity due to the duration required to relocate the SEMP and associated equipment with every vessel arrival and departure.

Mitigation measures may include:

- The provision of tugs to assist in CFSM vessel berthing.
- Stand down of construction operations and relocation of construction equipment away from Port prior to vessel berthing and departure.

Port operations following completion of Phase 2 construction

Upon the completion of Phase 2 construction and the commencement of operations at both berths, the close proximity of the berths to one another will require re-evaluation of the current port approach and mooring strategy. Potential risk mitigation strategies could include the use of tugboats for every vessel arrival and departure. This will need to be assessed by Ports North.

[Construction of Rock Wharf and RCE Extension - Basis of Estimate](#)

¹ Ports North Long Term Maintenance Dredging Management Plan, Port of Cape Flattery

² Ports North Annual Report 2022-23

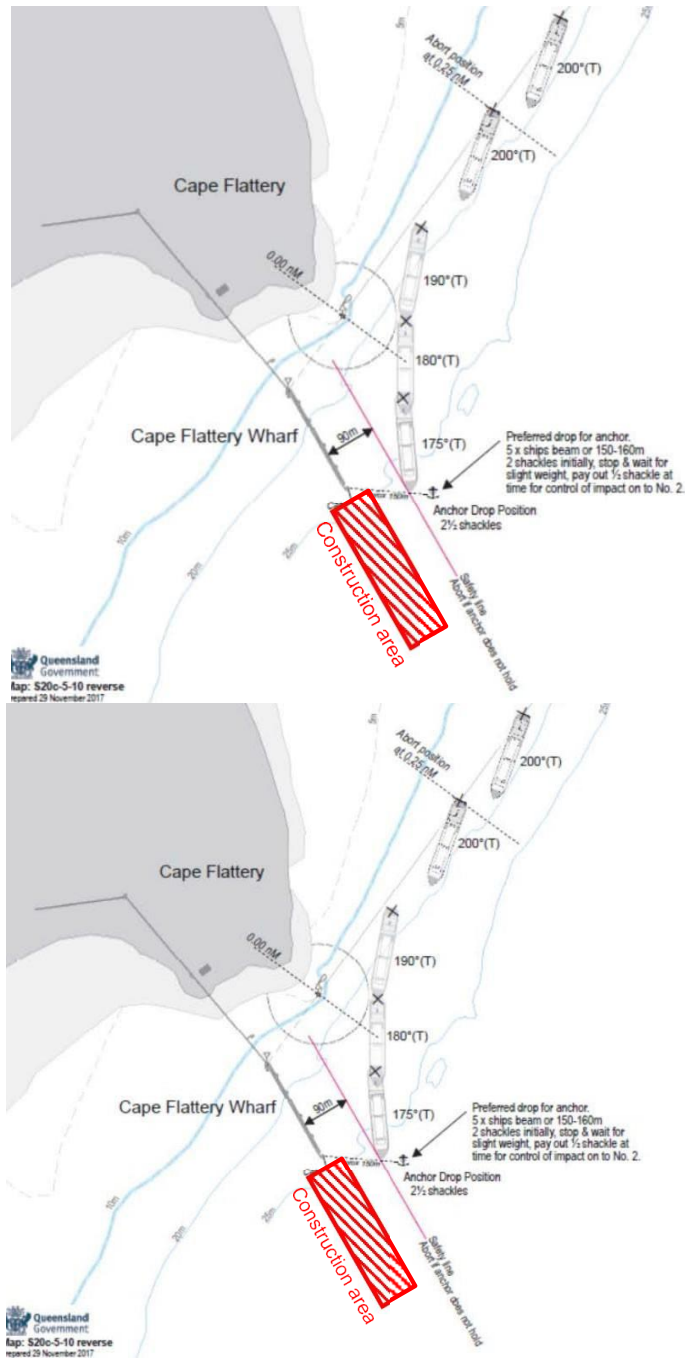


Figure 4041: PCF approach and anchorage

Removal / relocation of the existing mooring dolphin

The existing PCF jetty mooring dolphins Mooring Dolphin 1 (MD1) and Breasting Dolphin 1 (BD1) are the southernmost dolphins used for berthing Panamax (or larger) vessels by CFSM. The proposed new jetty extension dissects the vessel mooring lines when berthed at the PCF. The extent of the interface with the works is shown in Figure 38.

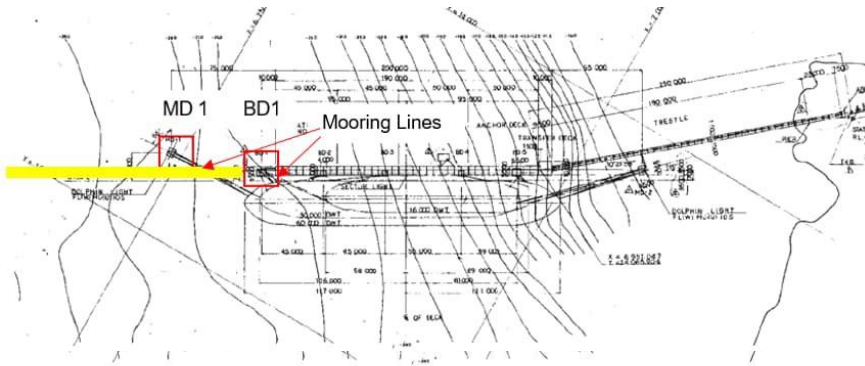


Figure 4142: PCF Dolphins

As MD1 is located to the rear of the proposed new berth extension, the mooring lines attached to both the vessel at PCF Jetty and MD1 will dissect the proposed construction area / new berth extension. During the detailed design phase of the works, consideration will need to be given to constructing either

a temporary mooring dolphin MD1 away from the works area interface or incorporating MD1 into the design of the permanent structure such that it does not impede operations at the new PCF berth but can also be constructed without impeding existing operations.

Parting mooring lines

Parting mooring lines presents a risk to worker's safety when conducting activities around berthed vessels. Snap-back occurs when a tensioned mooring line breaks, releasing stored energy and causing the line ends to recoil violently towards or past their secured ends. When a synthetic mooring line breaks, the snap-back effect can be extremely powerful, and the rope ends may reach a high velocity as they recoil. Anyone standing within the snap-back zone at either end of the line risks serious injury or death. The design of the new structure will need to consider worker safety during construction or relocating of the proposed jetty extension and conveyor supporting infrastructure sufficiently away from the existing jetty to avoid interaction with mooring lines.

14 Appendix A. Estimate Submission Schedule and Summary

Refer attachment.



AACE Class 5 Estimate
Northern Silica Project – Phase 1 RevA

Item #	Description	Unit	Quantity	Unit Rate	Amount
1000	PHASE 1 – TRANSHIPMENT FACILITY				
1100	Contractor Preliminaries				
1110	Contractor Recurring Costs for Project Management, Survey, Temporary Facilities, Indirect Costs	Lot	1.0	14,336,433.23	14,336,433.00
1120	Securities and Insurances	Lot	1.0	691,082.84	691,083.00
1130	Project Mobilisation	Lot	1.0	4,052,987.98	4,052,988.00
1140	Project Demobilisation	Lot	1.0	3,987,170.56	3,987,171.00
1200	Rock Works				
1210	Rock Wharf – Procure Quarry Material	Lot	1.0	29,138,814.48	29,138,814.00
1220	Rock Wharf – Logistics & Delivery of Quarry Materials to site by barge	Lot	1.0	26,667,396.38	26,667,396.00
1230	Installation of Rock Wharf core, filter, armour and fabric	Lot	1.0	8,897,021.50	8,897,022.00
1300	Marine Structures				
1310	Transship Berthing Structures	Lot	1.0	4,822,678.46	4,822,678.00
1320	RORO Ramp Facility – allow for construction of Ramp as per Concept Image	Lot	1.0	803,637.59	803,638.00
Item #	Description	Unit	Quantity	Unit Rate	Amount
1000	PHASE 1 - TRANSHIPMENT FACILITY				
1100	Contractor Preliminaries				
1110	Contractor Recurring Costs for Project Management, Survey, Temporary Facilities, Indirect Costs	Lot	1.0	14,336,433.23	14,336,433.00
1120	Securities and Insurances	Lot	1.0	691,082.84	691,083.00
1130	Project Mobilisation	Lot	1.0	4,052,987.98	4,052,988.00
1140	Project Demobilisation	Lot	1.0	3,987,170.56	3,987,171.00
1200	Rock Works				
1210	Rock Wharf - Procure Quarry Material	Lot	1.0	29,138,814.48	29,138,814.00
1220	Rock Wharf - Logistics & Delivery of Quarry Materials to site by barge	Lot	1.0	26,667,396.38	26,667,396.00
1230	Installation of Rock Wharf core, filter, armour and fabric	Lot	1.0	8,897,021.50	8,897,022.00
1300	Marine Structures				
1310	Transship Berthing Structures	Lot	1.0	4,822,678.46	4,822,678.00
1320	RORO Ramp Facility - allow for construction of Ramp as per Concept Image	Lot	1.0	803,637.59	803,638.00
1400	Product Handling and Loadout				
1410	Shiploader Package – Design, Supply, Delivery & Installation	Lot	1.0	8,101,152.17	8,101,152.00
1420	Feed Conveyor along Rock Wharf (400m long from Transfer Tower to barge loader)	Lot	1.0	4,288,173.74	4,288,174.00
1430	Transfer Tower Phase 1 CV	Lot	1.0	658,174.14	658,174.00
1440	Feed Conveyor Landside of Phase 1 transfer tower	Excluded			
1480	Services reticulation Phase 1 (provision)	Lot	1.0	708,800.89	708,801.00
1490	Gensets and loadbank – excluded (assumed hired and maintained as OPEX cost)	Excluded			
Subtotal – Phase 1 Direct Costs					107,153,524.00
Indirect/Owner Costs					
6000	Engineering				
6100	Engineering Design and Construction Support	Lot	1.0	3,750,276.23	3,750,276.00
7000	Temporary Facilities				
7100	Temporary Facilities – Construction Camp	Lot	1.0	9,994,491.45	9,994,491.00
7200	Temporary Facilities – Access, Enabling, Haul Roads, Water – Excluded	Excluded			
7300	Charter Flights Package – Brisbane to Site (wkly)	Lot	1.0	2,340,269.81	2,340,270.00
8000	Owner Costs				
8100	Project Management Team	Excluded			
8200	Owners Costs / Approvals	Excluded			
Subtotal – Phase 1 Indirect Costs					16,085,037.00
9000	Contingency				
9100	Contingency Provision (nominally 30% Class 5 AACE	Lot	1.0	36,963,059.88	36,963,060.00
1410	Shiploader Package - Design, Supply, Delivery & Installation	Lot	1.0	8,101,152.17	8,101,152.00
1420	Feed Conveyor along Rock Wharf (400m long from Transfer Tower to barge loader)	Lot	1.0	4,288,173.74	4,288,174.00
1430	Transfer Tower Phase 1 CV	Lot	1.0	658,174.14	658,174.00
1440	Feed Conveyor Landside of Phase 1 transfer tower	Excluded			



AACE Class 5 Estimate
Northern Silica Project – Phase 2 Rev A

1480	Services reticulation Phase 1 (provision)	Lot	1.0	708,800.89	708,801.00
1490	Gensets and loadbank - excluded (assumed hired and maintained as OPEX cost)	Excluded			
	Subtotal - Phase 1 Direct Costs				107,153,524.00
	Indirect/Owner Costs				
6000	Engineering				
6100	Engineering Design and Construction Support	Lot	1.0	3,750,276.23	3,750,276.00
7000	Temporary Facilities				
7100	Temporary Facilities - Construction Camp	Lot	1.0	9,994,491.45	9,994,491.00
7200	Temporary Facilities - Access, Enabling, Haul Roads, Water - Excluded	Excluded			
7300	Charter Flights Package - Brisbane to Site (wkly)	Lot	1.0	2,340,269.81	2,340,270.00
8000	Owner Costs				
8100	Project Management Team	Excluded			
8200	Owners Costs / Approvals	Excluded			
	Subtotal - Phase 1 Indirect Costs				16,085,037.00
9000	Contingency				
9100	Contingency Provision (nominally 30% Class 5 AACE Estimate)	Lot	1.0	36,963,059.88	36,963,060.00
9500	Escalation - Excluded	Excluded			
	Subtotal - Phase 1 Contingency				36,963,060.00
	PHASE 1 - TOTAL PROJECT COST (Q1,2024 Basis)				160,201,621.00



AACE Class 5 Estimate
Northern Silica Project - Phase 3 Rev A

Item #	Description	Unit	Quantity	Unit Rate	Amount
2000	PHASE 2 - JETTY LOADOUT FACILITY (5 Mtpa)				
2100	Contractor Preliminaries				
2110	Contractor Recurring Costs for Project Management, Survey, Temporary Facilities, Indirect Costs	Lot	1.0	22,958,855.59	22,958,856.00
2120	Securities and Insurances	Lot	1.0	2,017,048.29	2,017,048.00
2130	Project Mobilisation	Lot	1.0	13,037,167.44	13,037,167.00
2140	Project Demobilisation	Lot	1.0	6,864,992.70	6,864,993.00
2200	Marine Structures				
2210	Berthing and Mooring Dolphins				
2211	Berthing Dolphins	no.	5.0	3,166,632.23	15,833,161.00
2212	Mooring Dolphin	no.	1.0	3,068,313.88	3,068,314.00
2213	Demolition of Existing Mitsubishi Mooring Dolphin	no.	1.0	555,550.83	555,551.00
2220	Jetty Extension				
2221	Jetty Piling	Lot	1.0	18,026,125.64	18,026,126.00
2222	Jetty Pilecaps	Lot	1.0	2,298,812.40	2,298,812.00
2223	Steel Jetty Deck Structure	Lot	1.0	15,424,911.72	15,424,912.00
2230	Approach Jetty Structure - to support new feed CV and Transfer Tower				
2231	Piled Conveyor Support Structure	Lot	1.0	8,783,166.27	8,783,166.00
2232	Transfer Tower Piled Support Structure	Lot	1.0	4,586,302.08	4,586,302.00
2300	Product Handling and Loadout				
2310	Feed Conveyor - Overland (670m total from Phase 1 Transfer Tower to Jetty Transfer tower)	Lot	1.0	6,178,188.10	6,178,188.00
2320	Transfer Tower to Jetty Transfer tower)	Lot	1.0	9,627,416.10	9,627,416.00
2330	Feed Conveyor - Marine (in 475m long truss conveyor from Transfer Tower to feed ship loader)	Lot	1.0	2,298,486.21	2,298,486.00
2340	Transfer Towers (in 2 No)	Lot	1.0	24,487,881.05	24,487,881.00
2400	Services				
2410	Services provision - Electrical, Hydraulic and Cathodic Protection	Lot	1.0	13,148,166.68	13,148,167.00
2420	Services headworks and landside services - excluded	Excluded			
	Subtotal - Phase 2 Direct Costs				169,194,546.00
	Indirect/Owner Costs				
6000	Engineering				
6100	Engineering Design and Construction Support	Lot	1.0	5,921,157.31	5,921,157.00
7000	Temporary Facilities				
7100	Temporary Facilities - Phase 2 construction crew at construction establishment	Lot	1.0	3,966,861.65	3,966,862.00
7200	Landside Facilities - Access, Enabling, Haul Roads, Water - Excluded	Excluded			
7300	Charter Flights Package - Brisbane to Site (only)	Lot	1.0	2,628,374.00	2,628,374.00
8000	Owner Costs				
8100	Project Management Team	Excluded			
8200	Owners Costs / Approvals	Excluded			
	Subtotal - Phase 2 Indirect Costs				12,516,393.00
9000	Contingency				
9100	Contingency Provision (nominally 30% Class 5 AACE)	Lot	1.0	54,517,933.69	54,517,934.00



AACE Class 5 Estimate
Northern Silica Project - Phase 4 Rev A

9500	Estimate) Escalation - Excluded	Excluded	
	Subtotal - Phase 2 Contingency		54,517,934.00
	PHASE 2 - TOTAL PROJECT COST (Q1,2024 Basis)		236,228,873.00

Appendix E: COWIE ENVIRONMENTAL REPORT

Environmental Services Report



Brett Plant
Director
Advisory Partner Connect Pty Ltd
Level 18/324 Queen Street,
Brisbane City Qld 4000

Memo

Prepared by:	Santiago Lam
Cc:	Brendan Cowie
Date:	5 March 2024
Re:	Summary of Diatreme Resources proposed Northern Silica Project - silica sand mine at Cape Flattery
Re:	Summary of Diatreme Resources proposed Northern Silica Project - silica sand mine at Cape Flattery

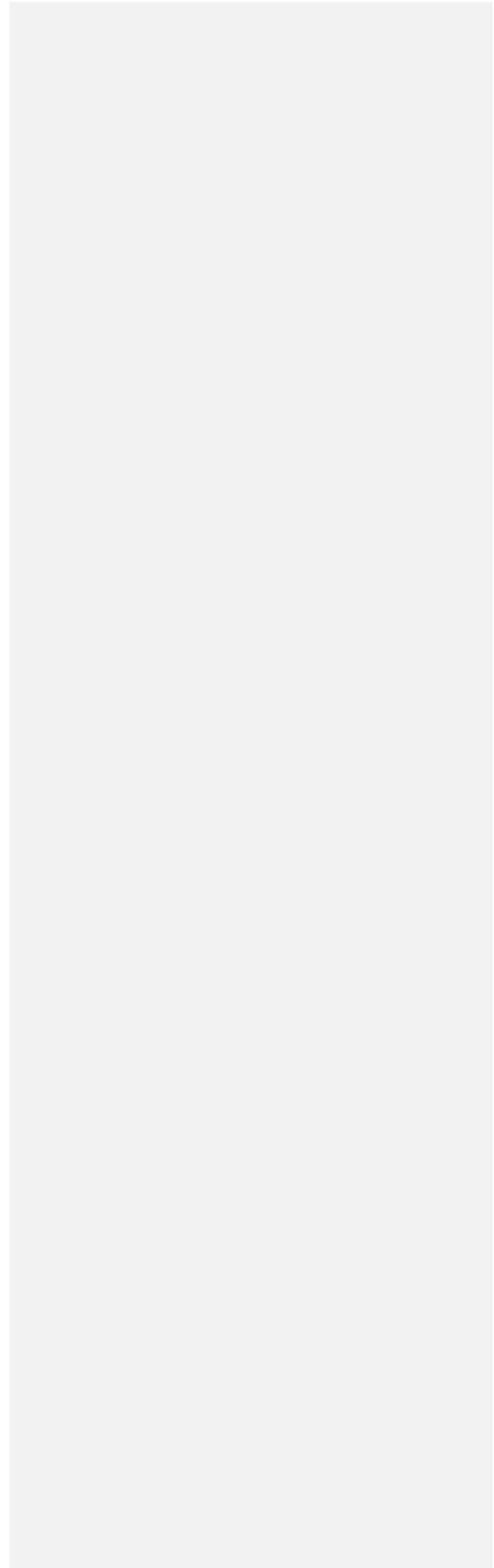
EXECUTIVE SUMMARY

Cowie Environmental Service Pty Ltd were engaged by Metallica Minerals Limited to complete an environmental review of Diatreme Resources Ltd (Diatreme) current projects. Diatreme is an emerging Australian producer of mineral and silica sands with a current project portfolio that includes proposed mineral and silica sands mines within Queensland and Western Australia.

The aim of the assessment was to understand the environmental constraints that the current projects are presented with. This assessment was based on factual publicly available data.

Diatremes key standalone projects include the Galalar Silica Sand Project at Cape Bedford, the Northern Silica Project (NSP) at Cape Flattery and the Cyclone Zircon Project in Western Australia. Diatremes main focus at present is the NSP, which has a significant resource of high-purity silica sand with the potential for long-term extraction. The NSP project was classified as a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (ref. EPBC 2023/09485) on June 14, 2023 and on the January 12, 2024, the project was designated as a coordinated project under the *State Development and Works Organisation Act 1971*.

Diatreme's export focus as referred to in their IAS for the NSP is to gain approval to use existing marine infrastructure at Mitsubishi's silica sand mine. Should approval not be granted to use this infrastructure, NSP will have to refocus on other noted options which may result in a redesign and rethink of their project approach. This has the potential to impact their supply distribution methodology and infrastructure, which may present some additional currently unknown environmental approvals constraints.



PURPOSE

This memo has been developed by Cowie Environmental Services Pty Ltd (Cowie) to summarise the status to date of the proposed Diatreme Resources Ltd (Diatreme) silica sand mines in and around Cape Flattery. The memo includes a summary of Diatreme as a company, details on the proposed silica sand mines, where it is in the approvals process and a summary of the full approval pathway. This memo has been prepared using publicly available information on Diatreme and predominantly refers to the proposed silica sand project known as the Northern Silica Project (NSP).

SUMMARY OF DIATREME RESOURCES LIMITED

Diatreme Resources Ltd (ASX:DRX) is an emerging Australian producer of mineral and silica sands based in Brisbane. Diatreme's key standalone projects include the Galalar Silica Sand Project at Cape Bedford (EPM17795) and the NSP which is adjacent to Mitsubishi's Cape Flattery Silica Mine (CFSM) at Cape Flattery. Diatreme also has the Cyclone Zircon Project in Western Australia, which is considered the largest undeveloped high-grade zircon project in the Eucla Basin.

NORTHERN SILICA PROJECT

NSP has an established indicated and inferred resource of 235 million tonnes of high purity silica sand, with potential for further expansion. A Scoping Study released in June 2023 highlighted the potential for a valuable long life mining operation, of significant scale and in close proximity to existing marine infrastructure. The study indicated a potential production rate of 5 million tonnes per annum (Mtpa) could be sustained for 25 years, with potential for further resource expansion.

The project is proposed as a drive-in, drive-out operation creating 120 jobs and training opportunities for the local community. Diatreme's website (<https://diatreme.com.au/northern-silica>) also mentions metallurgy tests have indicated the NSP's ability to produce a high purity, low iron silica product suitable for solar panel manufacturers and other specialty glass makers.

In June 2022, Diatreme announced a transformational strategic partnership with global material solutions leader Sibelco. A leading supplier of silica to the Asian market for specialty glass, Sibelco brings world-class silica processing and technical knowledge along with marketing and development expertise based on its 150 years of international experience.

Sibelco completed in December 2022 its first tranche investment (\$11m) to hold a 9.99% project interest, with a second investment tranche undertaken in October 2023 (\$24m) taking its total project interest to 26.8%, with the balance (73.2%) held by Diatreme.

NSP PROGRESS TO DATE

The Federal Minister for Environment and Water classified NSP as a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (ref. EPBC 2023/09485) on June

14, 2023. Consequently, an Initial Advice Statement (IAS) for NSP was prepared and submitted on November 29, 2023. On January 12, 2024, the project was designated as a coordinated project under the *State Development and Works Organisation Act 1971*. Currently, NSP is awaiting the Terms of Reference (ToR) to be prepared for the Environmental Impact Statement (EIS).

Figure 1 shows the current coordinated projects occurring in the Cape Flattery region. The site consists of different areas designated for Northern Silica mining operations. MLA100308 is where the main mining activities, processing, and stockpile areas occur alongside related infrastructure. There is one dune lake within MLA100308 which is approximately 0.85km² in size. MLA100310 is a planned area for mining infrastructure that will create a pathway for a conveyor linking MLA100308 to the Port of Cape Flattery, crossing an existing mining lease. The Port is located adjacent to ML100313 which is owned by Ports North and operated by Mitsubishi. It is also noted that as of the 4th of March 2024 Diatrene does not have approval to access this port. MLA100313 provides access over land owned by Ports North at the Port of Cape Flattery. MLA100311 and MLA100312 represent proposed mining infrastructure access roads from the Starcke Highway to the site, offering two alternative routes.

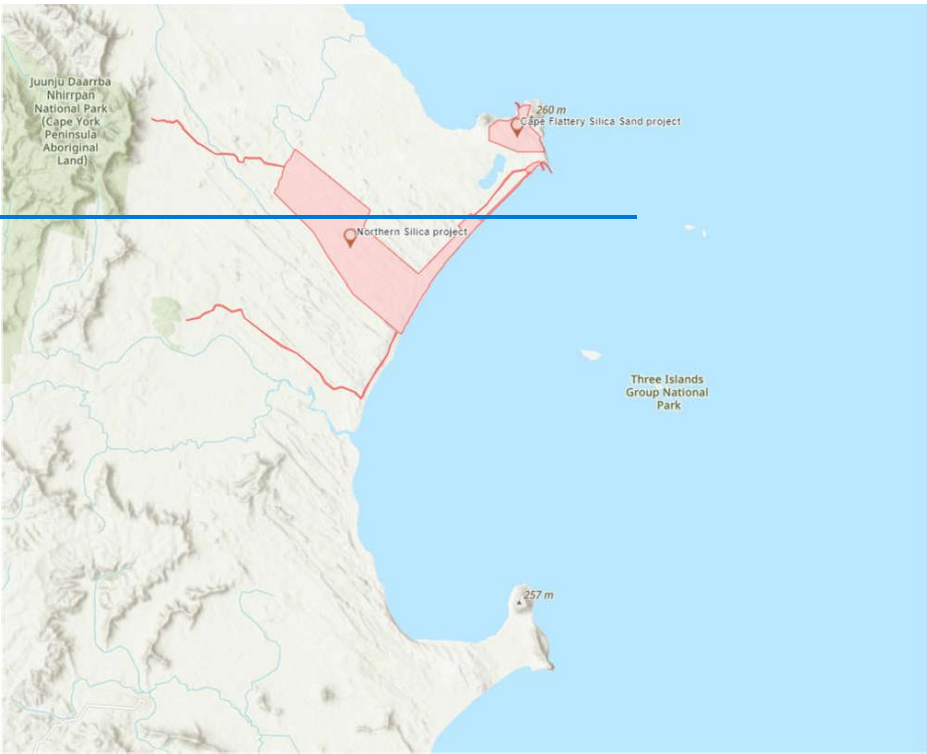


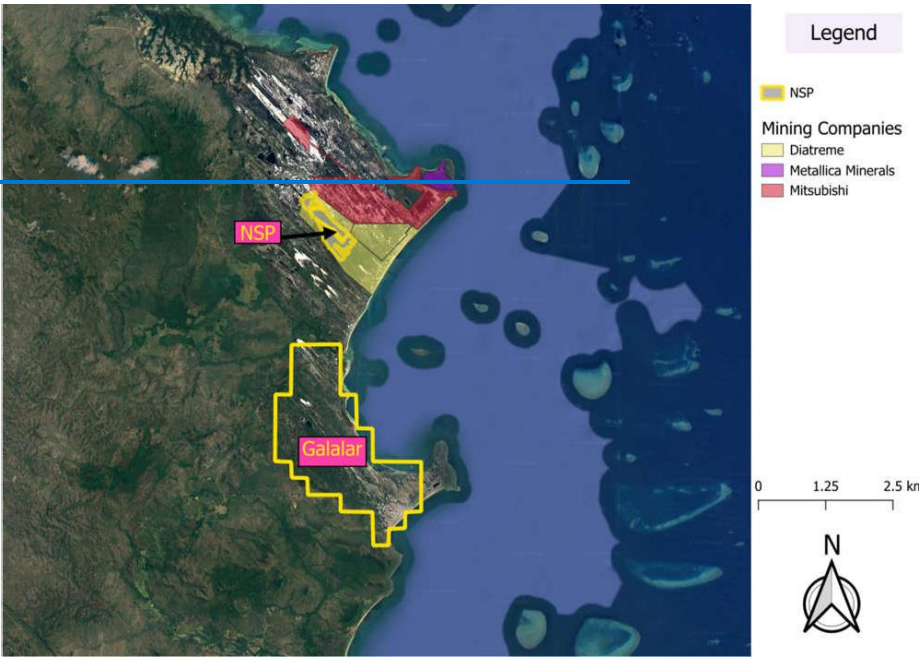


Figure 1: Coordinated Projects Map, Queensland Government (2021)

ADDITIONAL PROJECTS

Since 2019, Diatreme have been involved in the planning and approvals for the Galalar Silica Sand Project (GSSP), located east of the Hope Vale township between Cape Bedford and Nob Point (Figure 2). However, it should be noted that the NSP, following extensive exploration, resource definition and export optionality studies has become Diatreme's priority for development. In accordance with this, the EIS process for the GSSP has currently been withdrawn (including withdrawing of referral EPBC 2020/8626). Whilst the GSSP's established resource remains important to Diatreme, the development timeline for the GSSP will occur after the NSP becomes fully operational.

The Cyclone Zircon Project is located in Western Australia with an estimate of up to 203Mt at 2.3% HM (<https://diatreme.com.au/cyclone>). With a mining lease secured and definitive feasibility studies indicating a profitable venture with a 13.2-year mine life, Diatreme Resources has entered into partnerships with Chinese companies for off-take, investment, and construction services. The project's value is further enhanced by the inclusion of the strategic metal hafnium. On Wednesday, 6 September, 2023 Pursuant to section 45 of the Environmental Protection Act 1986, as applied by section 46(8), it has been agreed that the implementation conditions set out in Ministerial Statement No. 1052, be amended as specified in this Statement. This change included an extension of the conditional approvals for another five years from the date on the Statement (https://www.epa.wa.gov.au/sites/default/files/Ministerial_Statement/Ministerial%20Statement%201210.pdf).



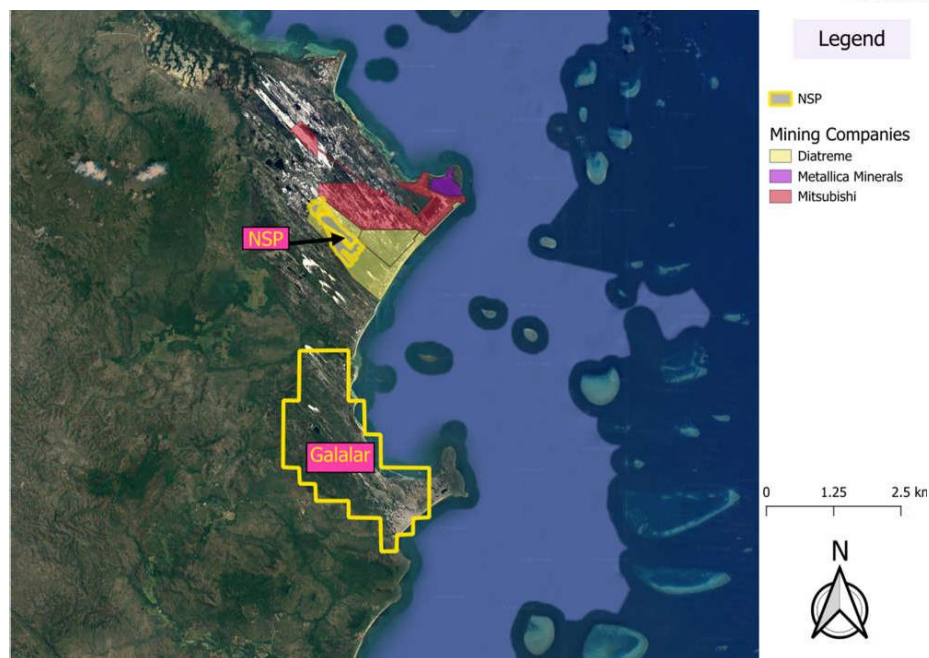


Figure 2: Diatreme projects overview, Cowie (2024)

NSP APPROVAL PATHWAY

Upon declaration as a coordinated project, a draft EIS terms of reference (ToR) will be prepared (which Diatreme expected Q4 2023 or Q1 2024, shown in figure 4) by the Office of the Coordinator General (OCG), this may be followed by a public consultation period for feedback. Once finalised, the proponent prepares a draft EIS (expected Q4 2024), which is then publicly released and evaluated by the OCG. Additional information may be requested during evaluation, and upon revision, the final EIS is released as a formal report if all conditions are satisfied by the OCG (expected Q1 2025 or Q2 2025). Figure 3 displays the full coordinated project process.

Steps in the assessment process

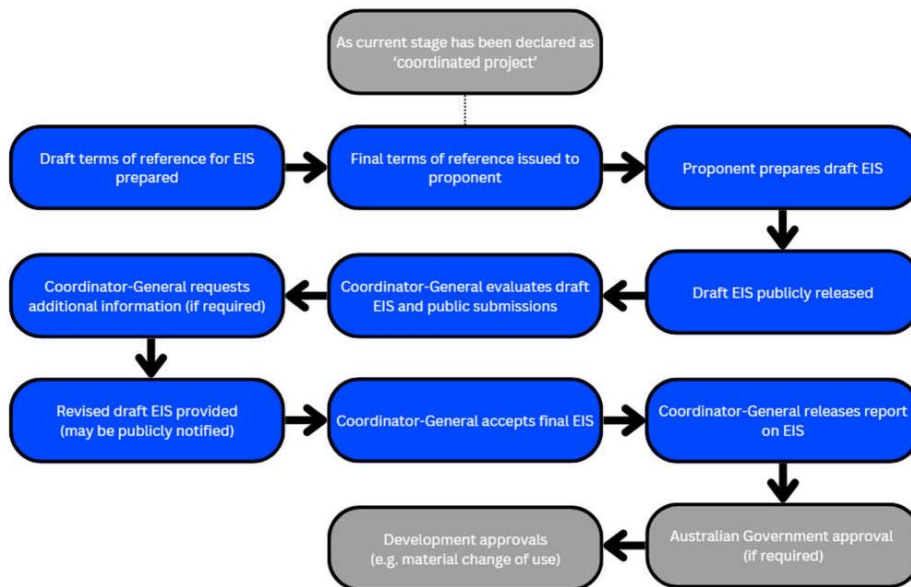


Figure 3: Assessment process, Queensland Government (2021)

Northern Silica Project Summary Timeline 2023-2026*



*Subject to advancement through permitting and approvals

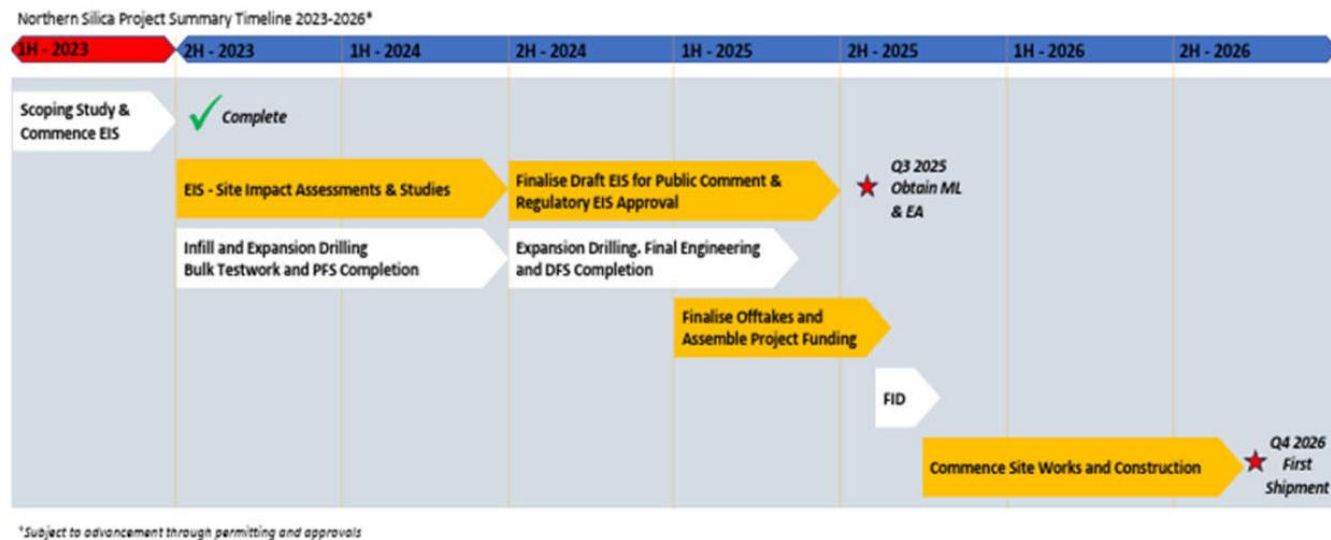


Figure 4: Diatreme expected pathway, BMT (2023)

ADDITIONAL APPROVALS

Due to the complexity of NSP, a series of approvals would be required beside the Coordinator-General's Evaluation Report (CGER), as detailed in Table 1 and Table 2 below:

Table 1: All stated approvals of NSP, BMT (2023)

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
SDPWO Act	Coordinator-General's Evaluation Report	Whole of project	Office of the Coordinator-General	ToR issued for the project	Yes – seeking imposed conditions
ACH Act	CHMPs	One for each Aboriginal Party within the overarching project	Native Title body / Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	CHMP guidelines	No – to be developed in parallel with the EIS
SSRC Act	SIA and SIMP	While of project	Office of the Coordinator-General	SIA and SIMP guidelines	Yes – assessed as part of the EIS
EP Act	Resource EA and EAs for ERA 31, 8 and 63	Mining activities and mining infrastructure, including vegetation clearing	DES	EP Act / EP Regulation requirements / Mining Model Conditions (as applicable)	Yes – seeking stated conditions
EP Act	EA for ERA 50	Export	DES	EP Act / EP Regulation requirements	Yes – seeking stated conditions
EP Act	PRCP	Mining activities	DES	Guideline ESR/2019/4964 Progressive rehabilitation and closure plans	Partial – seeking stated conditions associated with rehabilitation to align with PRCP but recognise actual PRCP approval is granted alongside EA
Water Act	Water licence	Water extraction and use	RDMW	N/A	Yes – seeking stated conditions or recommended stated conditions

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
SDPWO Act	Coordinator-General's Evaluation Report	Whole of project	Office of the Coordinator-General	ToR issued for the project	Yes – seeking imposed conditions
ACH Act	CHMPs	One for each Aboriginal Party within the overarching project	Native Title body / Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships	CHMP guidelines	No – to be developed in parallel with the EIS
SSRC Act	SIA and SIMP	While of project	Office of the Coordinator-General	SIA and SIMP guidelines	Yes – assessed as part of the EIS
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EP Act	EA for ERA 50	Export	DES	EP Act / EP Regulation requirements	Yes – seeking stated conditions
EP Act	PRCP	Mining activities	DES	Guideline ESR/2019/4964 Progressive rehabilitation and closure plans	Partial – seeking stated conditions associated with rehabilitation to align with PRCP but recognise actual PRCP approval is granted alongside EA
Water Act	Water licence	Water extraction and use	RDMW	N/A	Yes – seeking stated conditions or recommended stated conditions

Table 2: All stated approvals of NSP, BMT (2023)

Legislation	Approval	Project element	Administering authority	Assessment benchmarks / guidelines	Coordinated project EIS scope
Planning Act	Development Permit for concurrence ERA	Mining activities, export	State Assessment and Referral Agency	State code 22	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for tidal works	Maritime infrastructure	Ports North / State Assessment and Referral Agency	State code 7 and state code 8 Port of Cape Flattery Land Use Plan and development codes	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for waterway barrier works	Infrastructure crossings of waterways	State Assessment and Referral Agency	State code 18	Yes – seeking stated conditions or recommended stated conditions
Planning Act	Development Permit for marine plant disturbance (if applicable)	Clearing of marine plants	State Assessment and Referral Agency	State code 11	Yes – seeking stated conditions or recommended stated conditions
NC Act	Protected Plant Permit	Clearing or translocating protected plant species	DES	Protected Plants Assessment Guidelines	No, but to be considered in general recommendations for the CGER
NC Act	Species Management Program	Affecting the breeding habitat of a species	DES	Information sheet: Requirements for tampering with a protected animal breeding place in Queensland	No, but to be considered in general recommendations for the CGER
Environmental Offsets Act	Agreed Delivery Arrangement	Any significant residual impact	DES	Significant Residual Impact Guidelines	Yes – EIS to include a biodiversity offset strategy or equivalent if required

It is also noted that additional assessments may be required as a result of the above listed approvals. Such as the requirement to undertake an assessment against State code 11 for clearing of marine plants.

The Project Area is located within the Cape Flattery Dune Lakes system, which is a listed wetland of national importance on the *Directory of Important Wetlands in Australia (DIWA)* (No. QLD059). Lacustrine and palustrine waterbodies are classified as high ecological significance (HES) wetlands (Figure 5). HES wetlands are mapped across the north-western transport route, throughout the main mining area (MLA100308) and to the north-east. Therefore, the project will require a Development Approval for operational works in a wetland protection area as the NSP will impact the highly ecologically significant wetland under the *Environmental Protection Act 1994 (EP Act 1994)*. Diatremes IAS states there are littoral rainforests on the mine site which are Matters of National Environmental Significance (MNES), however it does not mention the protected wetlands and their regulatory requirements.

NSP would also need development permits, the EA for export operations and environmental management plans which show how you'll avoid and minimise the impacts of a project you've referred under the EPBC Act. These are tertiary approvals as they relate primarily to operationally specific activities that can only be resolved through more detailed design.

NSP has proposed an initial production capacity during Phase 1 of 3.75Mtpa which then will expand to 6.25Mtpa during Phase 2. This surpasses existing operations, potentially straining the capacity of the wharf at Mitsubishi. While discussions are ongoing with Mitsubishi's CFMS for access, access continues to be refused. Access to the wharf may only be able to be secured under Section 316 of the *Mineral Resources Act 1989*, which allows the Minister for Resources to facilitate this access without the consent of the lease holder if, '[it] would optimise the development and use of the State's resources to maximise the benefit for all Queenslanders'. While the Coordinated Project pathway cannot direct an outcome related to a Ministerial-level decision under an Act, it can assist to assess, analyse and demonstrate that the criteria around optimisation of State resources is met should a section 316 access easement be sought for the NSP in future. Additionally, constructing a new rock barge facility within the port's limits is proposed to support construction initially and later facilitate silica product transshipment to ocean-going vessels (OGV). This may trigger additional development permits in the future pathway.



LEGEND		Title:	Figure:	Rev:
Project Elements D Camp, CFP Onshore Lease, Infrastructure Corridor CFSM, Process and Infrastructure, Revised NRP MLA, Stockpile 1 & 2 Si2 Nth Extension Drilling Si2 Nth Resource Port Limits Marine Park - Highly Protected Zones MSES Reefs and Shoals		Figure 4 HES wetlands surrounding NSP Seagrass High Ecological Significance Wetlands Regulated Vegetation 100m from Wetland Selected Mining Leases	MSES Wetlands and Coastal Habitats around the Project Area BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map. N L 0 5km BMT	4.6 A
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Figure 5: Wetland on NSP, Cowie (2024)

ENVIRONMENTAL CONSTRAINTS

Land

Soils at NSP consist of primarily Daunt soil units, prone to blowouts, with vegetation consisting of mainly heath and perched lakes common at the site. NSP may contain acid sulphate soils which could acidify and degrade water quality. There is no identified known contamination present on the site. Additionally, the area does not currently engage in active agriculture. National parks in Cape York Peninsula are unaffected by the project (Figure 6).



LEGEND

E2L Land Boundaries
D Project Elements
 Camp, CFP Onshore Lease, Process and Infrastructure, Infrastructure Corridor, Revised NRP MLA, Stockpile 1 & 2
 Si2 Nth Extension Drilling
 Si2 Nth Resource

Title:

Local National Parks and Cape York Peninsula Aboriginal Land

BMT endeavours to ensure that the information provided in this map is correct at the time of publication. BMT does not warrant, guarantee or make representations regarding the currency and accuracy of information contained in this map.

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Figure:

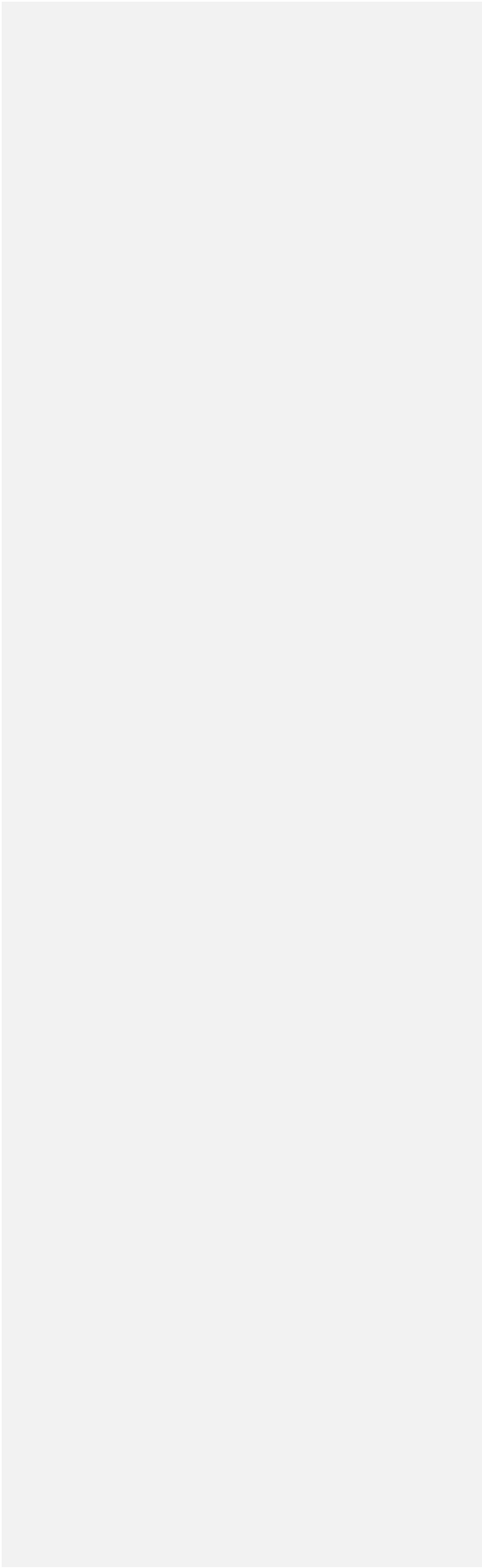
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Figure 6 – NSP in relation to National park



Water

As there is limited water supply available from other allocation holders and sources, this water allocation will be subject to an approval process under the *Water Act 2000* and *Water Plan (Cape York) 2019* to allow for access to the strategic reserve. The total volume of water sought from the reserve is 3,500ML/yr for the life of the mine. While the limit for a water license from the Strategic Reserve is 25, 000ML, the proposed water licence is therefore within the water license limit. However, the NSP's IAS only mentions 3186ML/yr without clarifying the additional 400ML (Figure 7).

Usage	Description	Water loss	ML/year
Processing water usage			
Product water loss	5Mtpa product to stockpile	15% water drains to ground	882
Reject sand water loss	1.33Mtpa reject sand to mine rehabilitation	40% water drains to ground	887
Fine rejects water loss	0.34Mtpa fine reject to mine rehabilitation	80% water drains to ground	1,360
Evaporation	10ha wet area	2m evaporation	20
Processing sub-total			3,149
Facilities and services water usage			
Accommodation camp and amenities	100-person camp, offices, work facilities	100 people x 300L/day	11
Road maintenance	Maintenance and dust control	20kL trucks, 2 per day	15
Workshops and equipment maintenance	Cleaning vehicles, machinery, equipment	30m ³ per day	11
Facilities and services sub-total			37
Total site water usage			3,186

Figure 7: NSP water consumption, BMT (2023)

Mining processes include groundwater extraction and reinjection. The operation also involves direct discharge of contaminants from mining operations to waterways or water bodies other than re-injection of clean water back to the groundwater aquifer. The mining footprint should avoid and be buffered from wetlands, waterbodies and waterways on the mining lease area and demonstrate 'no change' to groundwater and surface water quality offsite.

Diatreme has commenced water quality monitoring for the site, this remains in a preliminary stage, it is not clear how Diatreme propose to achieve 2 years of water quality data prior to their EIS process which Diatreme expects to finish in 2024.

There is currently no evidence to suggest that diversion of surface water or other surface waterbodies will occur as part of the project. With GIS investigation of NSP, it appears that the site intersects a number of waterways under the *Fisheries Act 1994* and potential watercourses under the *Water Act 2000* (Figure 8). If this is the case the proposed mine activities will trigger additional approvals not already identified. Confirmation is required from both the Department of Agriculture and Fisheries and Department of Regional Development, Manufacturing and Water as to the waterway and watercourse determination of the water features on site.





Figure 8: NSP's area impacting Fisheries Act waterways, Cowie (2024)

Flora and fauna

NSP is part of a coastal dune system, it hosts a diverse range of vegetation communities and habitats supporting various flora and fauna typical of littoral environments. High ecologically significant wetlands are present within the proposed mine footprint. No reefs or shoals that are directly adjacent to the area are impacted based on the current project. The NSP IAS includes reference to requiring further investigations for rocky shores, sparse macroalgae and coral species in the broader marine study area to inform the EIS.

With GIS investigation, areas impacted by Matters of State Environmental Significance (MSES) are shown in figure 9. The MSES contains local endanger species or protected vegetation.



Figure 9: NSP area impacted by MSES, Cowie (2024)

Costal environment

NSP overlaps with coastal management districts as shown in figure 10. If mining operations occur within these areas, there is potential for the mine footprint to enter the tidal area and highest astronomical tide zone. NSP also involves the construction of new infrastructure in the coastal zone (e.g. conveyor, new maritime infrastructure), and may impact on the foredune and marine habitats which supports shorebirds and marine turtles. The controlled action includes the potential for turtles to be present on the beach where the conveyor or slurry pipeline will be.



Figure 10: NSP overlap with CMD, Cowie (2024)

Flooding and regulated structure

NSP is not designated as a flood zone under Hope Vale Aboriginal Shire Council local planning schemes. No regulated structures like dams or levees are planned for the project area. Therefore, there is a risk of flooding to the site and access road which could lead to restricted movement during the wet season.

Air quality

Minimal industrial emissions are expected from NSP, with no local air quality monitoring available. Anticipated emissions include dust and plant emissions from mining and port activities.

Noise and vibration

Noise sources in the NSP are anticipated to be minimal, primarily from mining activities and Port of Cape Flattery operations. Sensitive receptors, such as the Australian Kite Surfari hotel, are located over 20 km away, therefore any noise impact on important amenity is anticipated to be minimal.

Community

Diatreme intend to employ a local workforce, focusing on housing and community wellbeing in the townships of Hope Vale and Cooktown. Any employees living in the wider community will be accommodated in Hope Vale and Cooktown during construction and transported to site via bus.

Traditional land ownership (TLO)

NSP is undertaking close consultation with the local Registered Native Title Body Corporates (RNTBCs) and Traditional Owners in the area to identify and avoid areas of cultural heritage significance. Mining Project Agreements (MPAs) will be established with Traditional Owner representative organizations to confirm equity sharing arrangements and employment opportunities. Negotiations for these agreements are ongoing and expected to conclude by the end of 2023. However, there is no indication of any completed agreements at the time of this memo.

All quantifiable constraints

Upon GIS analysis of all relevant constraints, the analysis indicates that the above detailed constraints would impact a total area of 282.8113 hectares as shown in Figure 11.





Figure 11: All relevant impactful constraints on NSP, Cowie (2024)

SUMMARY

A series of approvals will be required for the NSP, including the Coordinator-General's Evaluation Report (CGER) under the SDPWO Act and Controlled Activity Approval under the EPBC Act. Furthermore, there will be a need to apply for and be granted additional environmental approvals that may not yet be identified in the NSP IAS. Any additional environmental approvals may result in future restrictions or amendments to the design/layout and scale required.

Diatreme's export focus as referred to in their IAS for the NSP is to gain approval to use existing marine infrastructure at Mitsubishi's silica sand mine. Should third party approval not be granted to use this infrastructure, NSP will have to refocus on other noted options which may result in a redesign and rethink of their project approach. This has the potential to impact their supply distribution methodology and infrastructure, which may present some additional currently unknown approvals constraints.

Yours sincerely,

A handwritten signature in black ink that reads "B. Cowie".

Brendan Cowie

Principal Environmental Scientist and Managing Director
Cowie Environmental Services Pty Ltd

REFERENCE LIST

1. Australian Government, Department of Climate Change, Energy, the Environment and Water. (2023) Action management plans for projects referred under the EPBC Act. Reviewed from: <https://www.dcceew.gov.au/environment/epbc/advice/action-management-plans>
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6. Queensland Government. (2021) The Coordinated Project process. Reviewed from: <https://www.statedevelopment.qld.gov.au/coordinator-general/assessments-and-approvals/coordinated-projects/the-coordinated-project-process>