SR.

HANSON TWEED SAND PLANT EXPANSION
PHASE 5 TO PHASE 11

PREPARED FOR
Hanson Construction Materials Pty Ltd

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Submission Report

Hanson Tweed Sand Plant Expansion Phase 5 to Phase 11

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This report has been prepared for:
Hanson Construction Materials Pty Ltd

Document Control

Issue	Date	Description	Prepared By	Checked By
A	11/10/2021	WIP Draft for Project Team Input	LN	-
B	28/10/2021	Lodgment to DPIE	LN	LN

Content

Tables

Figures

Appendices

Submission Response Documents

Attachment 1A – Submission Response Table
Attachment 1B – G&S Response Comments
Attachment 1C – TBLALC Response Comments
Attachment 1D – JWA Biodiversity & Rehabilitation Response Comments

Amended & Supplementary Figures and Studies

Attachment 2 – Revised Appendix D1 - Flood & Stormwater Assessment
Attachment 3 – Revised Appendix G - Air Quality Assessment
Attachment 4 – Revised Appendix H1 - BDAR

Attachment 5 – Revised Appendix H2 – Concept Rehabilitation & Landscape Management Plan
Attachment 6 – Revised Appendix J – Traffic Impact Assessment
Attachment 7 – Revised Appendix A3 – Existing & Proposed HTSP Footprint
Attachment 8 – Revised Appendix A13 – Extraction Phasing Plan
Attachment 9 – Revised Appendix A14 – Site Layout Plans
Attachment 10 – Revised Appendix A15 - Conceptual Final Landform Plan
Attachment 11 – Revised Appendix A16 - Rehabilitation Phasing Plan
Attachment 12 - Supplementary Water Quality Report – Minimal Impact Considerations
Attachment 13 - Supplementary Groundwater Model Report
Attachment 14 – Supplementary Water Balance Modelling Report
Attachment 15 – Revised Appendix F1 – Operational Noise Impact Assessment
Attachment 16 – Revised Appendix F2 - Construction Noise Assessment
Attachment 17 – Revised Appendix O – Visual Impact Assessment
Attachment 18 – Revised Appendix Q – Economic Impact Assessment
Attachment 19 – Revised Appendix I – Aboriginal Cultural Heritage Assessment

1.0 Introduction

This Submission Report has been prepared on behalf of Hanson Construction Materials Pty Ltd as part of the Hanson Tweed Sand Plant Expansion Phase 5 to Phase 11 (SSD-10398). This report addresses the comments received during the exhibition period and describes any changes made to the project and the application documentation because of the feedback received.

The application, including the Environmental Impact Statement (EIS), was exhibited from 22 April 2021 to 20 May 2021. Fifteen submissions were received, with eleven from public authorities, one from an organization and three from the public. The submissions identified several issues requiring further clarification.

This report addresses the comments received during the exhibition period and describes any changes made to the project or application documentation. Comments were received from the following public authorities, organizations, and the public:

Public authorities:

- DPI Fisheries.
- Heritage NSW - heritage council of NSW
- Crown Lands
- Heritage NSW - Aboriginal Cultural Heritage
- DPI Agriculture
- Regional NSW – Mining, Exploration & Geoscience
- Transport for New South Wales
- Environment Protection authority
- Natural Resources Access Regulator / DPI Water (Water Group)
- Tweed Shire Council
- Biodiversity and Conservation Division

Private organization

- Australian Bay Lobster Producers.

The public:

- Ms Josephine MacDougall
- Ms Cheryl Cooper
- Mr Stephen Segal (on behalf of Gales-Kingscliff Pty Limited)

The critical issues identified in submissions were broadly grouped into Traffic Impact and Access Configuration, Ecological Impact and Assessment, Flood Impact and Assessment and Ground and Surface Water. In addition, clarification was sought on matters relating to Aboriginal Cultural Heritage and End-Use. A list of each of the comments received and how they have been addressed is provided in a table in **Attachment 1A**.

Changes made to the proposal are broadly summarized as:

- An alternative site access arrangement.
- Revised internal haulage route.
- Revised extraction lakes and buffers.
- Revised flood and stormwater management strategy

The supporting figures and studies have been updated as outlined in Section 4.2 and are provided as attachments to this report. Submission items that have not explicitly been addressed via revised figures or supporting study have been discussed in the submission response table in **Attachment 1A** of this report.

2.0 Overview of Exhibited Project

2.1 Project Description – As exhibited

The project is the expansion of the existing Hanson Tweed Sand Plant (HTSP). The project name is Hanson Tweed Sand Plant Expansion Phase 5 to Phase 11.

The HTSP and the project site are located at Cudgen NSW 2487 within the Tweed LGA. Regionally, HTSP is located 8.5 kilometres south of the New South Wales/Queensland state border; 1.5km west of the coastal suburb of Kingscliff NSW 2487; 14 kilometres northeast of the rural town Murwillumbah NSW 2484; and 23 kilometres north of the Tweed LGA / Byron LGA boundary. **Figure 1** and Appendix A1 identify the location of the project amongst these regional reference points.

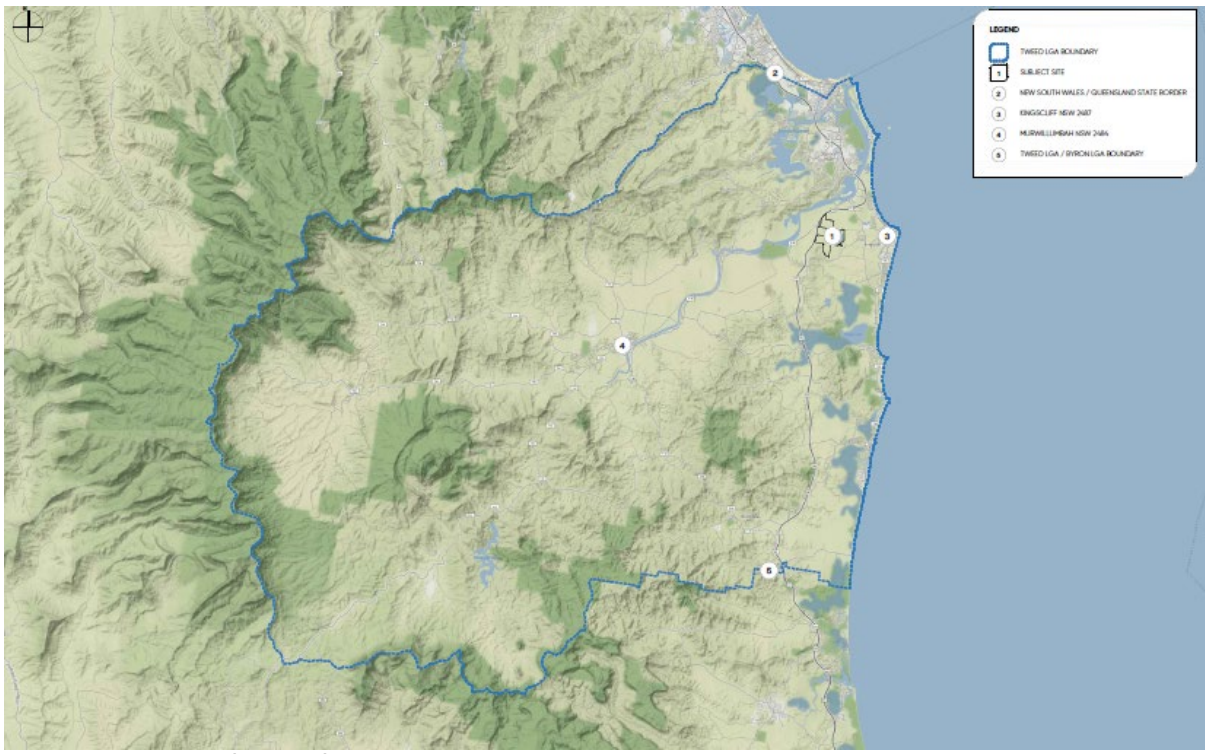

Figure 1: Site Location (Regional)

Locally, HTSP and the project site is positioned between the Pacific Highway (M1) and Tweed Valley Way interchange to the north and west; Tweed Coast Road to the east and Cudgen Road / Cudgen Plateau to the south. **Figure 2** and Appendix A2 identify the location of the project amongst these local landmarks and uses.

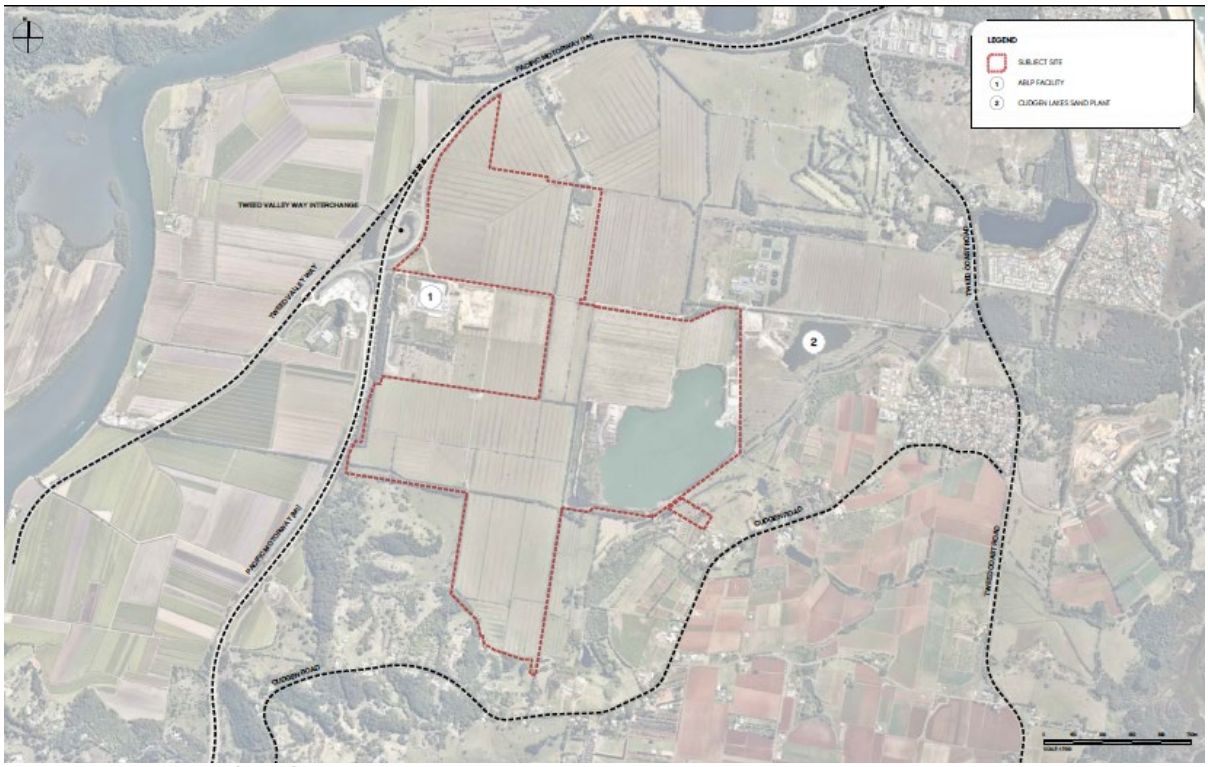

Figure 2: Site Location (Local)

The sand plant has operated since 1983, with Hanson acquiring and operating the sand plant since 2007. HTSP Phase 4 is currently operational on part of the project site and is estimated to have 6 to 10 years of resource remaining (depending on market conditions). The existing HTSP extraction footprint is approximately 46ha, and production and transport are a maximum of 500,000 tonnes per annum. Material extraction is via dredge with a variable depth (20m below ground level nominal).

The proposed Phase 5 to Phase 11 expansion would access a sand resource of 30-35 million tonnes and provide production and transport of a maximum 950,000 tonnes per annum (market driven). The proposed expansion footprint is approximately 190ha. This would result in a total footprint for HTSP of approximately 236ha. The sand resource will continue to be extracted via dredge to a variable depth (20m below ground level nominal). Onsite processing will continue. The project life is 30 years (market driven), spanning seven extraction phases.

Figure 3 and Appendix A3 identify the existing HTSP extraction footprint and the proposed expansion footprint.

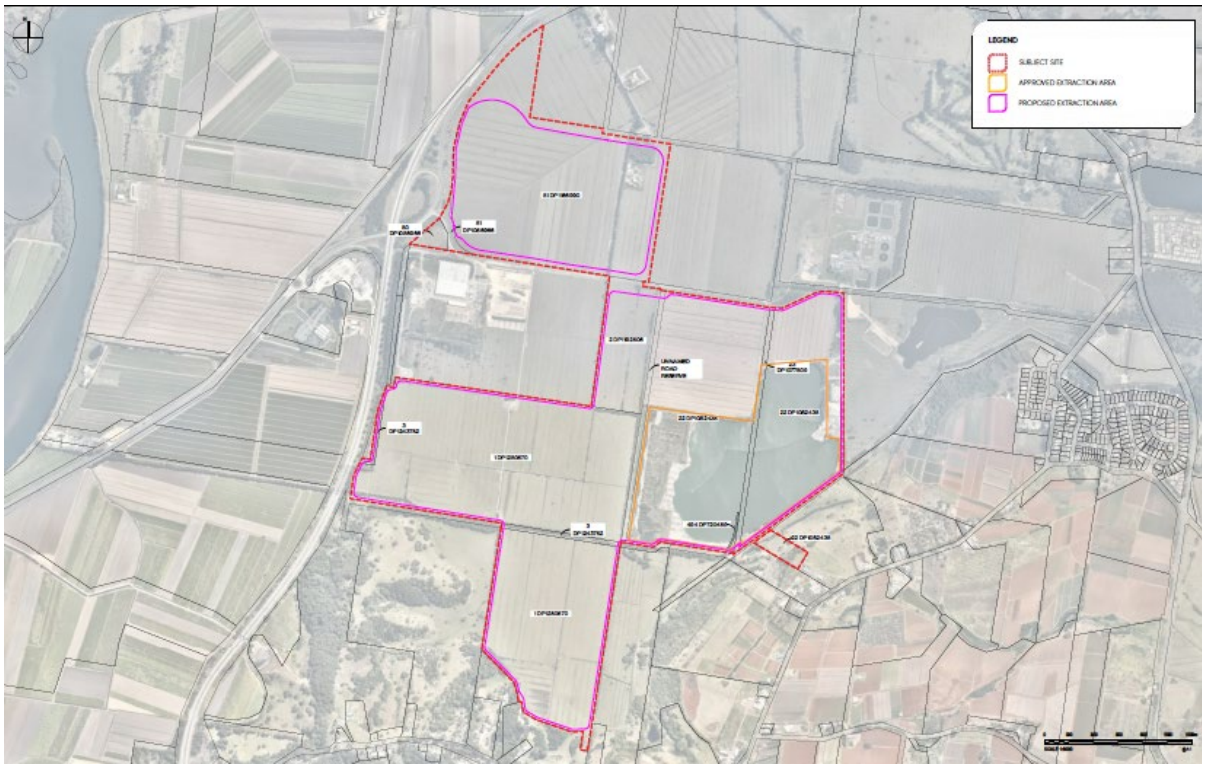

Figure 3: Existing & Proposed HTSP Footprint

Phase 5 of the project will include completing any Phase 4 extraction that is yet to be completed and the re-extraction of the Phase 1 to 4 areas to ensure project depth has been achieved and to establish the proposed final lake bank profiles throughout these locations.

The project will provide new private haulage road with connection to the Tweed Valley Way / M1 Interchange. The existing HTSP Phase 1 to 4 haulage route of Altona Road / Crescent Street / Tweed Coast Road will be abandoned, removing all HTSP vehicles from local roads. The existing site buildings and wash plant will remain in use during Phases 5 and 6. The site buildings and wash plant will be relocated to an alternative position onsite from Phase 7 onwards.

The operating hours for extraction, processing, loading and dispatch of trucks and maintenance are proposed to be 24 hours, seven days a week.

The Site will be subject to progressive rehabilitation resulting in a naturalized final landform. Total rehabilitation area is approximately 20 hectares or nearly 10% of the Site.

2.2 Key Issues – As exhibited

As identified within the SEAR's, all matters were identified as 'Key Issues' with no 'Other Issues' or 'Scoping Issues' being identified. The key issues and the subsets of these as exhibited related to:

- Water
    - Surface Water
    - Ground Water

  - Flooding / Stormwater

- Noise
  - Operational Noise
  - Construction Noise
- Air Quality
- Biodiversity
- Heritage
  - Aboriginal Cultural Heritage
  - Historical Heritage in Vicinity
- Traffic & Transport
- Land Resources
  - Acid Sulfate Soils
  - Agricultural Land
  - Landforming and Stability
  - Land Contamination
- Waste
- Hazards
  - Flood
  - Bushfire
  - Consumables
- Visual
- Social
- Economic
- Cumulative Impact
- Rehabilitation

The analysis and discussion of the above key issues have not been reproduced in this Submission Report to avoid duplication. A detailed discussion of all these issues as exhibited is contained within Section 6.0 of the EIS.

3.0 Analysis of Submissions

3.1 About Submissions

Fifteen submissions were received, with eleven from public authorities, one from an organization and three from the public. Comments were received from the following public authorities, organizations and the public:

Public authorities:

- DPI Fisheries.
- Heritage NSW - heritage council of NSW
- Crown Lands
- Heritage NSW - Aboriginal Cultural Heritage
- DPI Agriculture
- Regional NSW – Mining, Exploration & Geoscience
- Transport for New South Wales
- Environment Protection authority
- Natural Resources Access Regulator / DPI Water (Water Group)
- Tweed Shire Council
- Biodiversity and Conservation Division

Private organization

- Australian Bay Lobster Producers.

The public:

- Ms Josephine MacDougall
- Ms Cheryl Cooper
- Mr Stephen Segal (on behalf of Gales-Kingscliff Pty Limited)

3.2 Key Issues

The issues identified in submissions can be broadly grouped into Traffic Impact and Access Configuration, Ecological Impact and Assessment, Flood Impact and Assessment and Ground and Surface Water. In addition, clarification was sought on matters relating to Aboriginal Cultural Heritage, End-Use and Air Quality measures.

The identified issues relate to the key issue categories of Traffic & Transport, Biodiversity, Hazards (Flood) and Water. The clarification items relate to Heritage (Aboriginal Cultural Heritage), Rehabilitation (End Use) and Air Quality.

As a concise number of submissions were received, the proponent has elected to address each submission individually. A list of each of the comments received and how they have been addressed is provided in a table in **Attachment 1A**.

4.0 Actions Taken During & After EIS Exhibition

This section provides a summary of the actions taken during & after the EIS exhibition.

4.1 During EIS Exhibition

No Actions Taken.

4.2 After EIS Exhibition

After the EIS exhibition and receiving public submissions, the immediate actions taken relate to engaging, where relevant, with the public authorities and the public organization that provided a submission and commissioned the EIS consultant team to review and prepare additional or amended studies required.

As part of these actions, the following has occurred:

a) Revision of the following EIS supporting studies & figures in direct response to addressing the submissions:

- Appendix A3 – Existing & Proposed HTSP Footprint
- Appendix A13 – Extraction Phasing Plan
- Appendix A14 – Site Layout Plans
- Appendix A15 - Conceptual Final Landform Plan
- Appendix A16 - Rehabilitation Phasing Plan

- Appendix D1 - Flood & Stormwater Assessment
- Appendix G - Air Quality Assessment
- Appendix H1 - BDAR
- Appendix H2 – Concept Rehabilitation & Landscape Management Plan
- Appendix J – Traffic Impact Assessment

b) Preparation of new supplementary reports as follows:

- Supplementary Water Quality Report – Minimal Impact Considerations
- Supplementary Groundwater Model Report
- Supplementary Water Balance Modelling Report

c) Completion of a voluntary referral under the EPBC Act 1999.

d) Revision of the following EIS supporting studies & figures to ensure consistency across the body of information:

- Appendix F1 – Operational Noise Impact Assessment
- Appendix F2 - Construction Noise Assessment
- Appendix I – Aboriginal Cultural Heritage Assessment
- Appendix O – Visual Impact Assessment
- Appendix Q – Economic Impact Assessment

e) No changes have been made to the following EIS supporting studies & figures.

- Appendix A1 – Site Location (Regional)
- Appendix A2 – Site Location (Local)

- Appendix A4 – Project Site / Enabling Works Lot & Plan Location
- Appendix A5 – Unnamed Road Reserve Road Closure & Purchase Application Area
- Appendix A6 – Zoning Plan
- Appendix A7 – Services Diagrams
- Appendix A8 – Surrounding Sensitive Receivers Natural
- Appendix A9 – Agricultural Land Mapping
- Appendix A10 – Tweed Aboriginal Cultural Heritage Management Plan Mapping
- Appendix A11 – Local Heritage Item Mapping
- Appendix A12 – Surrounding Sensitive Receivers Dwellings
- Appendix A17 – Protected Matters Search Tool Results
- Appendix A18 – Bushfire Prone Land Mapping
- Appendix A19 – TSC Pre-Lodgment Meeting Minutes

- Appendix B – Surface Water Assessment
- Appendix C - Ground Water Assessment (Noted, items in this report have been superseded by the supplement reports identified above)
- Appendix D2 – Flood Response Plan
- Appendix E – Soil & Water Management Plan
- Appendix K – Acid Sulfate Soils Assessment
- Appendix L – Preliminary Site Investigation
- Appendix M – Agricultural Land Assessment
- Appendix N1 – Geotechnical Investigation
- Appendix N2 – Lake Bank Profiles
- Appendix P – Social Impact Assessment

5.0 Changes to the project

The following changes have been made to the project.

- Reconfiguration of the proposed access to the Tweed Valley Way / M1 Interchange. The access will now be via roundabout rather than a merging slip lane. It is proposed to dedicate land as road reserve as required to facilitate the new roundabout.

- Amendment of the location of the proposed internal haulage route. The internal haulage loop road previously located around the perimeter of Phase 10 & Phase 11 lake has been removed. The haulage route now runs 'centrally' east/west through the Site.

- Commitment to seal the full extent of the internal haulage road.

- Increase the buffer width to Pacific Highway Road Reserve (excluding that part adjacent to the offramp). The buffer to the Pacific Highway Road Reserve is now 50m. The buffer to the part of the road reserve that contains the offramp remains at 10m.

- Inclusion of a 50m buffer adjacent to the offsite groundwater-dependent ecosystem located west of Lot 1 DP1250570.

- Removal of previously proposed lake bunding and revision of stormwater management measures.

- Consequential changes to the lake configuration to incorporate the amended buffers relocated haulage route and revised access to the Tweed Valley Way / M1 Interchange.

6.0 Updated Project Details

The changes and additional studies undertaken have not resulted in significant changes to the project description. A revised project description is provided in Section 6.1. For ease of reference, items that have been deleted are identified with ~~a strikethrough~~, and new items that have been added are highlighted in yellow.

6.1 Project description

The project is the expansion of the existing Hanson Tweed Sand Plant (HTSP). The project name is Hanson Tweed Sand Plant Expansion Phase 5 to Phase 11.

The HTSP and the project site are located at Cudgen NSW 2487 within the Tweed LGA. Regionally, HTSP is located 8.5 kilometres south of the New South Wales/Queensland state border; 1.5km west of the coastal suburb of Kingscliff NSW 2487; 14 kilometres northeast of the rural town Murwillumbah NSW 2484; and 23 kilometres north of the Tweed LGA / Byron LGA boundary. **Figure 4** identifies the location of the project amongst these regional reference points.

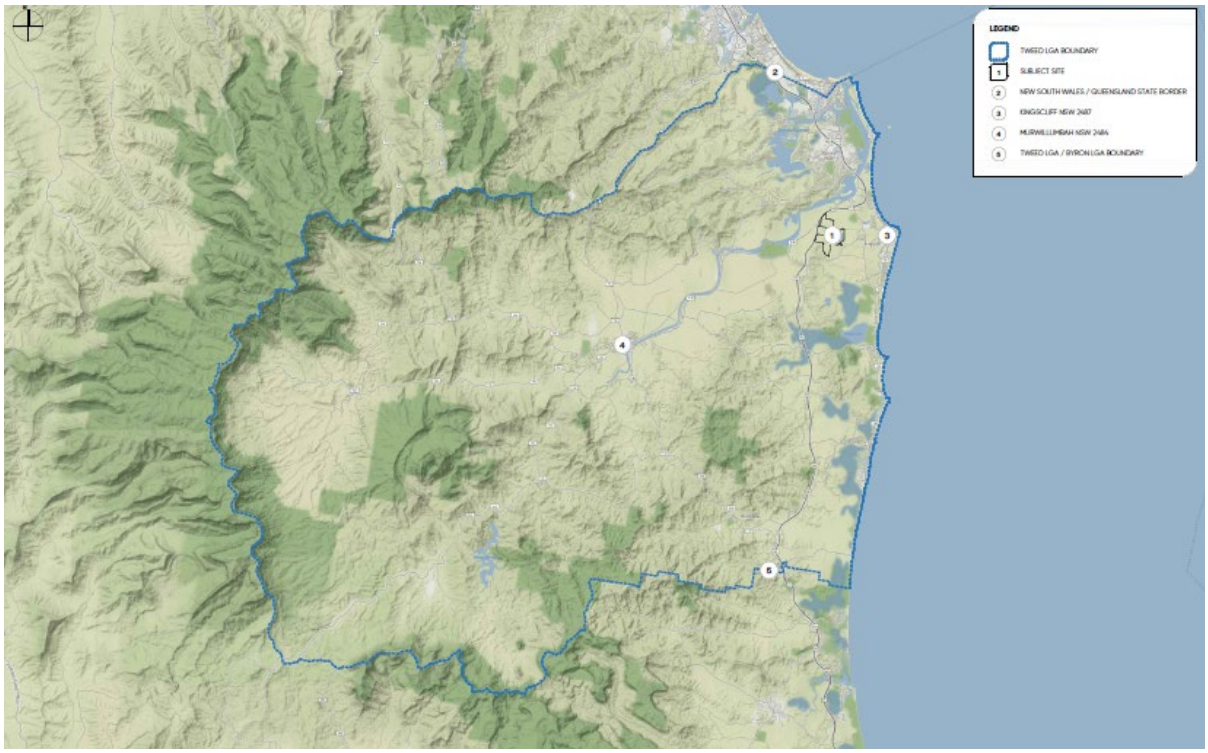

Figure 4: Site Location (Regional)

Locally, HTSP and the project site is positioned between the Pacific Highway (M1) and Tweed Valley Way interchange to the north and west; Tweed Coast Road to the east and Cudgen Road / Cudgen Plateau to the south. **Figure 2** identifies the location of the project amongst these local landmarks and uses.

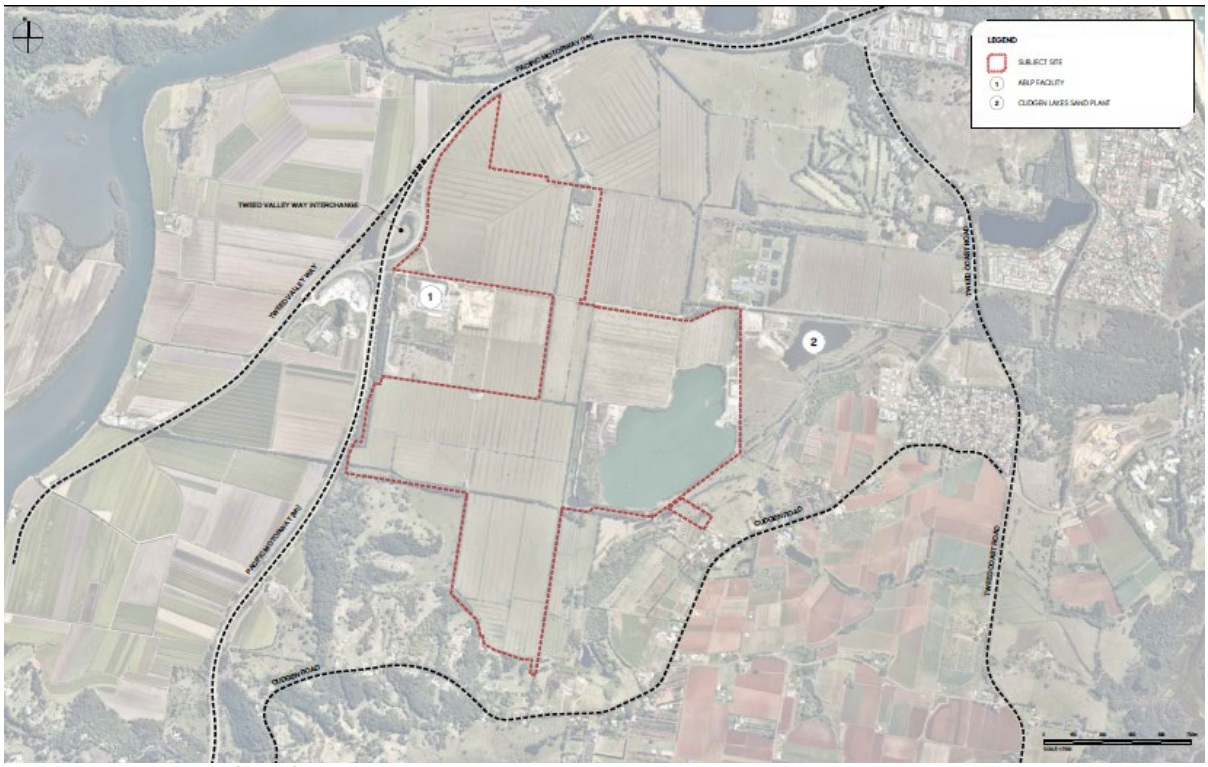

Figure 5: Site Location (Local)

The sand plant has operated since 1983, with Hanson acquiring and operating the sand plant since 2007. HTSP Phase 4 is currently operational on part of the project site and is estimated to have 6 to 10 years of resource remaining (depending on market conditions). The existing HTSP extraction footprint is approximately 46ha, and production and transport are a maximum of 500,000 tonnes per annum. Material extraction is via dredge with a variable depth (20m below ground level nominal).

The proposed Phase 5 to Phase 11 expansion would access a sand resource of 30-35 million tonnes and provide production and transport of a maximum 950,000 tonnes per annum (market driven). The proposed expansion footprint is approximately 190ha. This would result in a total footprint for HTSP of approximately 236ha. The sand resource will continue to be extracted via dredge to a variable depth (20m below ground level nominal). Onsite processing will continue. The project life is 30 years (market driven), spanning seven extraction phases.

Figure 6 identifies the existing HTSP extraction footprint and the proposed expansion footprint.

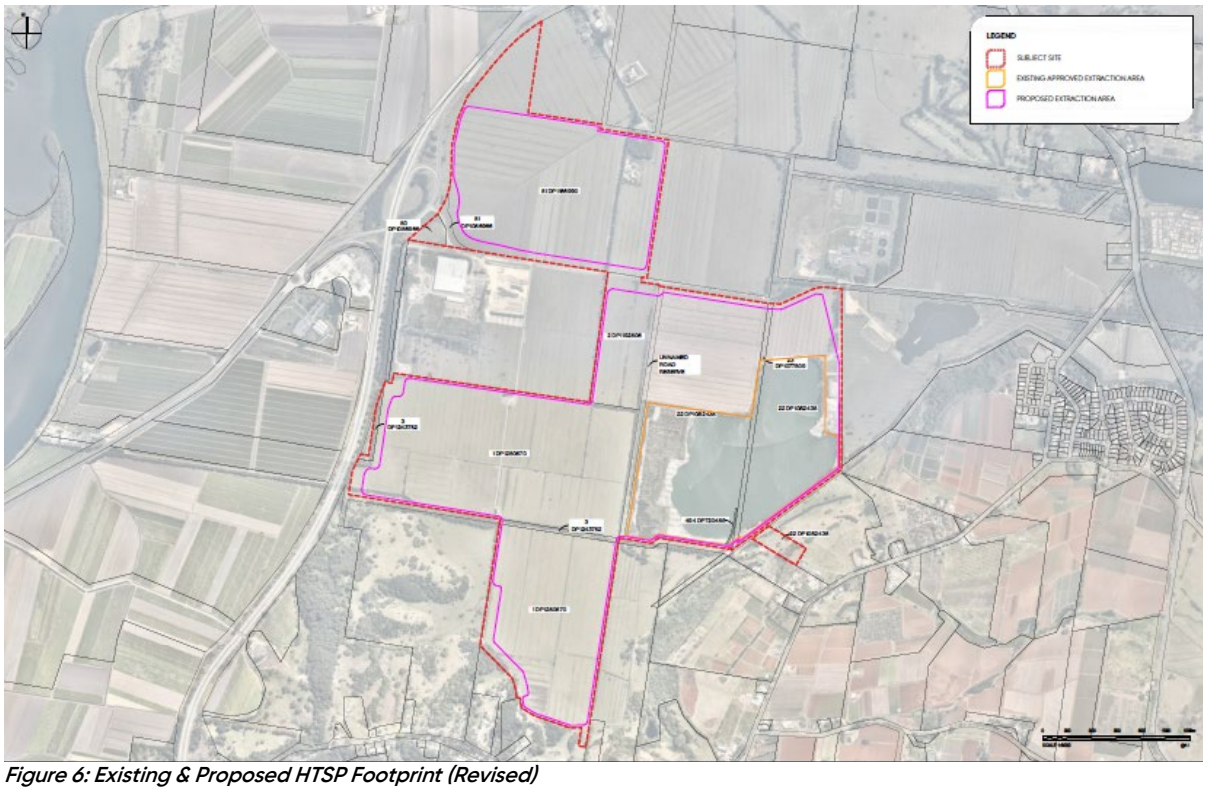

Figure 6: Existing & Proposed HTSP Footprint (Revised)

Phase 5 of the project will include completing any Phase 4 extraction that is yet to be completed and the re-extraction of the Phase 1 to 4 areas to ensure project depth has been achieved and to establish the proposed final lake bank profiles throughout these locations.

The project will provide new private haulage road with connection to the Tweed Valley Way / M1 Interchange. Works to connect to the interchange will see the construction of a new roundabout. The existing HTSP Phase 1 to 4 haulage route of Altona Road / Crescent Street / Tweed Coast Road will be abandoned, removing all HTSP vehicles from local roads. The existing site buildings and wash plant will remain in use during Phases 5 and 6. The site buildings and wash plant will be relocated to an alternative position onsite from Phase 7 onwards.

The operating hours for extraction, processing, loading and dispatch of trucks and maintenance are proposed to be 24 hours, seven days a week.

The Site will be subject to progressive rehabilitation resulting in a naturalized final landform. Total rehabilitation area is approximately ~~20~~ 38.21 hectares or ~~nearly 10%~~ over 16% of the Site.

6.2 Figures & Support Documents

The updated figures and supporting documents are contained within the Attachments to this report. These are identified as:

- Attachment 2 – Revised Appendix D1 - Flood & Stormwater Assessment
- Attachment 3 – Revised Appendix G - Air Quality Assessment
- Attachment 4 – Revised Appendix H1 - BDAR
- Attachment 5 – Revised Appendix H2 – Concept Rehabilitation & Landscape Management Plan
- Attachment 6 – Revised Appendix J – Traffic Impact Assessment

- Attachment 7 – Revised Appendix A3 – Existing & Proposed HTSP Footprint
- Attachment 8 – Revised Appendix A13 – Extraction Phasing Plan
- Attachment 9 – Revised Appendix A14 – Site Layout Plans
- Attachment 10 – Revised Appendix A15 - Conceptual Final Landform Plan
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- Attachment 12 - Supplementary Water Quality Report – Minimal Impact Considerations
- Attachment 13 - Supplementary Groundwater Model Report
- Attachment 14 – Supplementary Water Balance Modelling Report
- Attachment 15 – Revised Appendix F1 – Operational Noise Impact Assessment
- Attachment 16 – Revised Appendix F2 - Construction Noise Assessment
- Attachment 17 – Revised Appendix O – Visual Impact Assessment
- Attachment 18 – Revised Appendix Q – Economic Impact Assessment
- Attachment 19 – Revised Appendix I – Aboriginal Cultural Heritage Assessment

6.3 Amended Mitigation Measures & Residual Impacts

Table 1 provides a revised summary of the potential impacts, mitigation measures & residual impacts.

For ease of reference, items that have been deleted are identified with a ~~strikethrough~~, and new items that have been added are highlighted in yellow.

Table 1: Summary of Potential Impacts, Mitigation Measures & Residual Impacts

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
		WATER	
Water (Ground)	Changes to pre-development groundwater flow regimes.	<u>Management Plan</u> • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. <u>Monitoring and Reporting</u> • Monitoring and reporting will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	• Localized and minor changes to pre-development groundwater flow regimes in the vicinity of the extraction lake that will be largely contained within the development footprint.
Water (Ground)	Changes to ground water elevation.	<u>Management Plan</u> • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. <u>Monitoring and Reporting</u> • Monitoring and report will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	~~• Changes to groundwater elevation. These are predominantly contained within the development footprint, occurring within the northern and southern sections of the extraction footprint (Lot 51 on DP1166990 and Lot 1 on DP1250570 respectively) as follows:~~ ~~o There is a maximum 0.5m lowering of the water table in the northern portion of the expansion area. The impact is predominantly contained within the expansion footprint; however a decrease in groundwater elevation of up to 0.3 m is predicted within a small portion of the lands outside the northern perimeter of Lot 51 on DP1166990.~~ ~~o In the Site's southern extent, the steady-state model indicates a maximum 1.0 m lowering of the groundwater table predominantly within the expansion footprint. This impact reduces to a maximum of 0.5 m of drawdown outside the site boundary to the west of Lot 1 on DP1250570.~~ ~~• Impacts to GDE's are predicted to be minimal. A drawdown of up to 0.5 m is predicted to occur within a small portion of the Low Potential GDE, which is mapped on the southern boundary of the expansion footprint west of Lot 1 on DP1250570.~~ • Changes to groundwater elevation. These are predominantly contained within the development footprint, with minimal change occurring outside of the site boundary as a result of the TSP expansion. • Residual impacts are summarised as follows: o There is a maximum 0.5 m lowering of the water table in the northern portion of the expansion area. The impact is predominantly contained within the expansion footprint, however a decrease in groundwater elevation of up to 0.3m is

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
			predicted within a small portion of the lands outside the northern perimeter of Lot 51 on DP1166990. ○ With respect to the Low Potential GDE (Drawing No. 12035-501) adjacent the southern boundary of the expansion footprint west of Lot 1 on DP1250570. The revised groundwater model incorporates an increased buffer distance of ~50 m between the limit of extraction and the site boundary. Whilst groundwater drawdown is still predicted to occur within this area the increased buffer distance has reduced the lateral extent of offsite drawdown from 170 m to 155 m and reduced the magnitude of drawdown to between 0.1 m and 0.5 m. The footprint of offsite drawdown in this area has reduced by ~4,300 m2. ○ As the change in groundwater table predicted in this area is within the range of natural seasonal fluctuation, it is unlikely that the swamp sclerophyll forest (*Casuarina Glauca*) present in this area will experience negative impacts as a result of the localized change in groundwater conditions.
Water (Ground)	Groundwater quality degradation with potential exceed of relevant criteria of Tweed River Water Quality Objectives, ANZECC Water Quality Guidelines and NHRMC Recreation Water Quality Guidelines.	<u>Management Plan</u> • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. <u>Monitoring and Reporting</u> • Monitoring and report will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	• Minor exceedance of Iron within shallow groundwater at a small number of monitoring locations. • Nutrients (total nitrogen, total phosphorous), with recorded exceedances of performance criteria within both shallow and deep groundwater through the expansion area; and • Ammonia within deep groundwater.
Water (Surface)	Surface water quality degradation with potential exceed of relevant criteria of Tweed River Water Quality Objectives, ANZECC Water Quality Guidelines and NHRMC Recreation Water Quality Guidelines.	<u>Management Plan</u> • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. <u>Prescriptive Measure</u> • External stormwater catchments are to be accepted into or diverted around the extraction lakes to specified discharge points. These diversions (bunding & channel realignment) are to be consistent with the Flood and Stormwater Assessment prepared by Burchills Engineering Solutions dated February 2021. <u>Mitigation Measures</u> • A stormwater management plan is to be developed and implemented for the future Phase 7 wash plant. <u>Monitoring and Reporting</u> • Monitoring and report will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	• The long-term median for pH of surface waters within the TSP Lake is 8.34. This value marginally exceeds the Tweed River Water Quality Objective of 8.0 but complies with the ANZECC 2000 criteria for primary contact recreation of 6.5 to 8.5. • Long-term median results for total nitrogen and total phosphorus recorded within the HTSP lake exceed the Tweed River and ANZECC water quality objectives.

<table>
<tr><th>ISSUE</th><th>POTENTIAL IMPACT</th><th>APPROACH</th><th>RESIDUAL IMPACT</th></tr>
<tr><td>Water (Surface)</td><td>Change to the regime of surface water discharge to receiving environments</td><td><u>Management Plan</u>
A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.
<u>Prescriptive Measure</u>
Extraction lake overflow points are to be established adjacent designated discharge points. These overflow points are to be consistent with the Flood and Stormwater Assessment prepared by Burchills Engineering Solutions dated ~~February~~ October 2021.
<u>Monitoring and Reporting</u>
Monitoring and reporting will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.</td><td>~~Discharge frequency is estimated to increase to 58% of years (more than once every 2 years) when the southern external catchment comes online in Phase 6.~~
~~Long term, discharge from the southern lake is estimated to occur in approximately 43% of years (or once every 3-4 years).~~
Discharge from the south lake is predicted to occur in approximately 50 percent of years (or every second year) throughout the entire life of the development and continuing after completion when the lakes are in their final form. For each year when there is some discharge, the average number of days of active discharge is 11-14 days.
The north lake, with its lowered weir outlet, will discharge much more frequently and in almost all (96%) years. There is only an absence of discharge during the driest years. During discharge years, the north lake will spill much more frequently, with discharge occurring for between 93 and 126 days per year – or 1 in every 3 to 4 days.</td></tr>
<tr><td>Water (Flooding)</td><td>Displacement of floodwaters and adverse changes to flood characteristics of the locality.</td><td><u>Prescriptive Measure</u>
Lake bund invert levels are not to exceed a height of ~~1.75m~~ 0.5m AHD for Lake 1 (Phases 10 and 11) and ~~1.3m~~ 1.0m AHD for Lake 2 (Phases 5 through 9).</td><td>~~Minor changes in the local hydraulic regime are caused by a loss in conveyance storage through the inclusion of bunding around the proposed extraction lakes. The bunding around the lakes prevents external catchment runoff from entering the lakes frequently, flood events are permitted to overtop into the extraction lakes.~~
Some hydraulic impacts that are marginally outside of the allowable impact thresholds located in the Chinderah Township. These impacts however are short lived (occurring for only a three-year period during Phase 7), and as the Lakes take their ultimate form (Phase 11) become acceptable. Increases in peak flood level are primarily caused by a loss of floodplain storage.
Changes in inundation time will occur to a pair of properties located between the M1 and Tweed Valley Way, properties in this area will experience a nominal increase in time of inundation.</td></tr>
<tr><td colspan="4">NOISE</td></tr>
<tr><td>Noise (Operation)</td><td>Increase in noise levels at sensitive receivers, with potential exceedance of criteria during operation</td><td><u>Performance criteria</u>
Noise Generated by site operations will not exceed the following at the locations:<table><tr><th>Location</th><th>Period</th><th>Project trigger level $L_{Aeq,adj,15min}$, dB(A)</th></tr><tr><td></td><td>Day</td><td>42</td></tr></table></td><td>The results of the operational noise modelling indicate that during night-time, when the booster is positioned within proximity to the nearest noise sensitive receptors, a minor exceedance of the noise criteria may occur.</td></tr>
</table>

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT

Noise sensitive places to the east, and to the south-east (north of intersection between Cudgen Road and Plantation Road) *(zoned as RU1 and R2)*	Evening	**42**
	Night	**38**
Noise sensitive places to the south and south-west (south of intersection between Cudgen Road and Plantation Road) *(zoned as RU1)*	Day	**41**
	Evening	**41**
	Night	**38**
Noise sensitive places to the north at significant setback from Pacific Motorway *(zoned as RU1)*	Day	**42**
	Evening	**42**
	Night	**38**
Noise sensitive places to the north and west within proximity to Pacific Motorway *(zoned as RU1)*	Day	**46**
	Evening	**46**
	Night	**38**
School classroom	Noisiest 1-hour period when in use	**38**
Active recreation area (e.g. school playground)	When in use	**53**

However, these noise criteria will not apply if the applicant has an agreement with any impacted landowner to exceed the noise criteria, and the applicant has advised the Department in writing of the terms of this agreement.

Mitigation Measures

- Dredge noise levels will not exceed:

		Sound power level			Sound pressure level at 3m			Sound pressure level at 10m		
		dB(A)	dB(C)	dB(Z)	dB(A)	dB(C)	dB(Z)	dB(A)	dB(C)	dB(Z)
Phase 5	**Day**	108	115	115	90	97	97	80	87	87
	Evening	104	111	111	86	93	93	76	83	83
	Night	94	101	101	76	83	83	66	73	73
Phase 6	**Day**	108	115	115	90	97	97	80	87	87
	Evening	104	111	111	86	93	93	76	83	83
	Night	88	95	95	70	77	77	60	67	67
Phase 7	**Day**	108	115	115	90	97	97	80	87	87
	Evening	107	114	114	89	96	96	79	86	86
	Night	99	106	106	81	88	88	71	78	78
Phase 8	**Day**	108	115	115	90	97	97	80	87	87
	Evening	108	115	115	90	97	97	80	87	87
	Night	108	115	115	90	97	97	80	87	87
Phase 9	**Day**	96	103	103	78	85	85	68	75	75
	Evening	93	100	100	75	82	82	65	72	72
	Night	88	95	95	70	77	77	60	67	67
Phase 10	**Day**	108	115	115	90	97	97	80	87	87
	Evening	106	113	113	88	95	95	78	85	85
	Night	94	101	101	76	83	83	66	73	73
Phase 11	**Day**	108	115	115	90	97	97	80	87	87
	Evening	108	115	115	90	97	97	80	87	87
	Night	101	108	108	83	90	90	73	80	80

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
		Appropriate dredge upgrades will be undertaken to achieve the noise levels that are required for the relevant phase and operating time prior to commencing dredging in that phase and/or time period. • At all times booster pumps will be positioned at the maximum distance possible from noise sensitive receptors during daytime, evening, and night-time operations. • A partial acoustic enclosure is to be installed around the existing wash plant motor to enclose it on its south-east and south-west sides prior to operating the existing wash plant during the night-time period. Following design specifications are required for the acoustic enclosure: o The enclosure is to be constructed using a material with minimum surface density of 15kg/m^2 (e.g., timber palings with minimum thickness of 22mm, fibre cement sheeting with minimum thickness of 12mm, or aerated concrete); o The height of the enclosure is to be minimum 0.3m above the top of the wash plant motor, with returns along the south-east and south-west sides of the wash plant motor. o The enclosure should be free of any gaps. o If the walls of the enclosure are constructed of timber palings, planks should have minimum 35mm overlap; and o The enclosure should be of durable construction. **Management Plan** • A Noise Management Plan will be developed and implemented. **Monitoring and Reporting** • Annual attended compliance noise monitoring to be carried out at the nearest noise sensitive receivers (private residences or privately owned land).	
Noise (Construction)	Increase in noise levels at sensitive receivers, with potential exceedance of criteria during construction	**Mitigation Measures** • The measures outlined within Section 6 of the CNA are to be implemented as part of Construction Activities onsite. **Management Plan** • A Construction Noise Management Plan will be developed and implemented. This Construction Noise Management Plan will be consistent with the Construction Noise Assessment prepared by ATP Consulting Engineers dated ~~February~~ October 2021. **Monitoring and Reporting** • Noise monitoring should be undertaken on receipt of a noise complaint at an appropriate location near the origin of the complaint in accordance with the requirements of Australian Standard AS1055-2018 (Description and measurement of environmental noise) or any other noise monitoring methodology agreed with the regulatory authorities. If the results of noise monitoring indicate exceedance of the noise limits, appropriate noise mitigation measures should be implemented to reduce the noise levels.	~~• During construction of the haulage road, there is potential exceedance of the lower limit noise criteria at 271 Pacific Highway. The exceedance is associated with operation of the road grader, asphalt paver and tip truck along the haulage road alignment closest to the dwelling.~~ • During clearing works (overburden stripping) in preparation for Phase 9 there is potential exceedance of the lower limit noise criteria at 353 Cudgen Road. The exceedance is associated with operation of the body truck used to remove waste from Site at the southernmost section of the expansion.
AIR QUALITY			
Air Quality	Increase in dust and particulate matter, with potential exceedance of criteria	**Performance Criteria** • Particulate matter emissions generated by the development will not cause exceedance of the following criteria at any residence on privately-owned land: Pollutant / Averaging Period / Criterion	• There remains potential for cumulative 24-hour average concentrations of PM_{10} to exceed the impact assessment criterion. A PM_{10} monitoring program will be established so that site operations can effectively manage any potential elevated PM_{10} levels.

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT

Particulate matter < 10 µm (PM_{10})	Annual	[a,c] 25 µg/m³	
	24-hour	[b] 50 µg/m³	
Particulate matter < 2.5 µm ($PM_{2.5}$)	Annual	[a,c] 8 µg/m³	
	24-hour	[b] 25 µg/m³	
Total suspended particulates (TSP)	Annual	[a,c] 90 µg/m³	
Deposited dust [d]	Annual	[b] 2 g/m²/month	[a] 4 g/m²/month

Notes:
[a] Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).
[b] Incremental impact (i.e. incremental increase in concentrations due to the development on its own).
[c] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary).
[d] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3590.10.1:2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

Mitigation Measures

- The ~~permanent~~ haulage road is to be sealed.
- ~~The Phase 5 & Phase 6 temporary internal haulage rote will not be sealed.~~
- Loaded trucks are to be covered always except when loading / unloading.

Management Plan

- An Air Quality Management Plan will be developed and implemented. This plan will be consistent with the Air Quality Assessment prepared by Katesone Environmental dated ~~February~~ October 2021 and will:
  a) Be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary.
  b) Be prepared in consultation with the EPA.
  c) Describe the measures to be implemented to ensure:
     i. compliance with the air quality criteria.
     ii. best practice management is being employed; and
     iii. air quality impacts are minimized during adverse meteorological conditions and extraordinary events.
  d) describe the air quality management system in detail; and
  e) include an air quality monitoring program that:
     i. is capable of evaluating the performance of the development against the air quality criteria.
     ii. adequately supports the air quality management system.
     iii. includes a protocol for determining any exceedances of the air quality criteria.
     iv. includes continuous PM10 monitoring.

Monitoring and Reporting

- An air quality monitoring program will be developed and will include the following:
  - Continuation of the existing HTSP dust deposition monitoring on a monthly basis at the four locations, namely: northern boundary, eastern boundary, southern boundary and south-western boundary (Figure 6).
  - As the HTSP operations expand into the new area, a dust deposition site should be installed to the northwest in proximity to sensitive receiver R2 (refer Appendix G) and on the western boundary.
  - A continuous PM10 monitor, using a light scattering technique, should be installed to the south / southeast of the existing washplant with elevated levels triggering dust management actions. Dust management actions include determining if winds are from the plant to receptors (see meteorological monitoring), increased water application, limiting certain operations and ceasing operations.

BIODIVERSITY

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
Biodiversity	Direct Impacts • ~~Removal of 3.66ha of vegetation~~ • Removal of 3.82ha of vegetation and 2.06ha of land required to be rehabilitated under existing HTSP approvals. Potential Indirect Impacts • Alteration to drainage and hydrological regimes in the study area and adjacent areas; • Decline in water quality entering adjacent waterway areas (e.g. sediment load, pH, influx of pollutants, nutrient loading); • Potential impacts on groundwater. Given the nature of the site soils and groundwater characteristics observed to date, the most likely potential impacts on groundwater as a result of the development are (G&S 2021a): - Localized and minor changes to pre-development groundwater flow regimes in the vicinity of the lake that will be largely contained within the development footprint; and - Changes to groundwater elevation as a	**Mitigation Measures** • The project will generally be in areas which have historically been cleared or otherwise disturbed by clearing impacts. • The proposed development will be constructed in a manner sensitive to areas of retained habitat on adjoining land and designed in a manner that reduces associated indirect impacts. Prior to the commencement of sand extraction works within each phase, a phase specific BDAR (or assessment in line with the relevant legislation at that time) will be prepared to accurately assess impacts, avoidance and mitigation measures, and offset obligations. • A construction personnel induction program shall be developed by the proponent to highlight the presence of significant vegetation and habitat values adjacent to the Site. The general induction of all construction personnel will cover such matters as: - Areas adjacent to the Site in which significant vegetation and habitat values occur. - Threats to significant vegetation and habitat values associated with construction activities. - Requirement to report any incidents within the significant vegetation and habitat areas, and actions required; and - Requirements of any relevant Management Plans, particularly protocols for vegetation clearing and measures to protect all other native vegetation. • During construction activities, temporary high visibility fencing will be erected to assist in the protection of vegetation to be retained from all construction activities by restricting access from machinery and contractors. This fencing will be erected in accordance with Australian Standard 4970-2009 Protection of Trees and any additional requirements of a Vegetation Management Plan to be prepared by a suitably qualified ecologist. Temporary signage will be provided along all temporary fencing during the construction phase stating "Environmental Protection Zone – No Unauthorized Entry". • No machinery, rubbish or spoil will be stored within retained vegetation during the construction phase of the development. Vehicle/equipment wash-down areas or access tracks will not be located in or immediately adjacent to retained vegetation. • Vegetation will be inspected for fauna by a suitably qualified ecologist immediately prior to the commencement of clearing/earthworks. Any fauna detected within proposed clearing areas will be relocated to suitable habitat outside of the subject site. Consideration will be given to appropriate release times and locations for specific fauna groups and a record kept of all species encountered/relocated. **Management Plan** • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. • A Rehabilitation Management Plan will be developed and implemented. This plan will be consistent with the concept rehabilitation and landscape management plan prepared by JWA Ecological Consultants dated ~~March~~ October 2021 and will: (a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary. (b) be prepared in consultation with DPIE, Council and OEH. (d) include a detailed final landform concept plan showing the final lake and bank design. (e) describe how the rehabilitation of the Site would achieve the above performance criteria. (f) describe the short, medium, and long-term measures that would be implemented to: • rehabilitate and stabilize the Site; and • manage the restored vegetation and wetland habitat established on the Site. (g) include detailed performance and completion criteria for the rehabilitation and stabilization of the Site (including appropriate water quality criteria); (h) include a detailed description of the measures to be implemented on the Site to: • enhance existing vegetation and increase littoral and terrestrial habitat potential. • control terrestrial and aquatic pests and weeds. • control erosion. • control access; and • reduce the visual impacts of the development. (i) include a vegetation clearance protocol. (j) include a program to monitor, independently audit and report on the effectiveness of the measures in paragraph (f) above, and progress against the detailed performance and completion criteria in paragraph (g) above; and (k) include a Long-Term Management Strategy which:	• ~~There remains progressive removal of 3.66ha of vegetation.~~ • There remains progressive removal of 3.82ha of vegetation and 2.06ha of land required to be rehabilitated under existing HTSP approvals.

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
	result of the proposed expansion. These are predominantly contained within the development footprint, occurring within the northern and southern sections of the extraction footprint; • Increased opportunity for weeds to become established. Invasive landscape species may escape to adjacent areas of native vegetation; • Increased light, noise and activity may cause reclusive species to move away from habitat edges; • Increased risk of rubbish dumping, creation of walking tracks and associated impacts within adjacent native vegetation communities.	• defines the objectives and criteria for HTSP closure and post-extraction management. • describes the measures that would be implemented to minimize or manage the ongoing environmental effects of the project; and • describes how the performance of these measures would be monitored over time. (l) describe the potential risks to successful rehabilitation and/or revegetation, including a description of the contingency measures that would be implemented to mitigate these risks; and (m) detail who is responsible for monitoring, reviewing, and implementing the plan. <u>Monitoring and Reporting</u> *Rehabilitation monitoring* • Monitoring and reporting is critical in ensuring the continuing success of restoration works and will be carried out for the duration of project in accordance with the requirements of the Concept RLMP. To assess the success of rehabilitation works, vegetation assessments will be completed by a suitably qualified ecologist using plot-based vegetation surveys (transects and quadrats) and photo point monitoring. In addition, the rehabilitation team will also maintain records of works completed. The methodology to be used to monitor the rehabilitation works is outlined in the Concept RLMP. • To assess the suitability of the extraction lakes and Rehabilitation Areas for terrestrial and aquatic fauna, assessments of biological indicators (fish, birds, and macroinvertebrates) will also be undertaken by suitably qualified persons using the methodology outlined in the Concept RLMP. Monitoring of birds will be completed annually. Monitoring of fish and macroinvertebrates will be monitored at the end of each extraction phase. *Water quality monitoring* • Water quality in the extraction lake will be monitored on a biannual basis in accordance the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. *Reporting* • An Annual Rehabilitation Monitoring Report will be prepared which discusses the results of the monitoring of retained vegetation and rehabilitation areas against the Monitoring Performance Criteria identified in the Concept RLMP. Each Annual Rehabilitation Monitoring Report will be included in the Annual Environmental Monitoring Report (AEMR) which is submitted to the DPIE as part of the current sand extraction licencing requirements.	
HERITAGE			
Heritage (Aboriginal Cultural)	Potential exists for unknown items of Aboriginal Cultural Heritage to be present or unknown Aboriginal human remains to be present.	<u>Prescriptive measures</u> • Unexpected finds procedures will be implemented if suspected Aboriginal material is uncovered. These procedures will include: a) work in the surrounding area is to stop immediately. b) a temporary fence is to be erected around the Site, with a buffer zone of at least 10 metres around the known edge of the Site. c) an appropriately qualified archaeological consultant is to be engaged to identify the material. d) if the material is found to be of Aboriginal origin, the Aboriginal community is to be consulted in a manner as outlined in the Heritage NSW guidelines: Aboriginal Cultural Heritage Consultation Requirements for Proponents (Heritage NSW 2010). e) should the works be deemed to have harmed the Aboriginal objects Heritage NSW should be notified immediately via the EPA Enviro Hotline; and f) The Tweed Byron LALC will be engaged to support the implementation of the Aboriginal Object Find Procedure. • Unexpected finds procedures will be implemented if Aboriginal Human Remains are uncovered. These procedures will include:	• There remains potential for unknown items of Aboriginal Cultural Heritage to be present.

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
		a) all works must halt in the immediate area to prevent any further impacts to the remains. b) The Site should be cordoned off and the remains themselves should be left untouched. The nearest Police Station, the Tweed Byron LALC and the Heritage NSW Regional Office (Coffs Harbour) are all to be notified as soon as possible. c) If the remains are found to be of Aboriginal origin and the police do not wish to investigate the Site for criminal activities, the Aboriginal community and Heritage NSW should be consulted as to how the remains should be dealt with. d) Work may only resume after agreement is reached between all notified parties, provided it is in accordance with all parties' statutory obligations.	
Heritage (Other)	As discussed within Section 2.7.2 there are three items of local heritage in proximity to the Site. These items are sufficiently separated from the project site to avoid impact upon these items. The project will have no offsite impacts that could impact these items.	-	-
TRAFFIC & TRANSPORT			
Traffic & Transport	Increase in vehicle movements on local road network including Pacific Highway, Altona Road and Tweed Coast Road.	<u>Prescriptive Measure</u> • Altona Road / Crescent Street / Tweed Coast Road will not be utilized for Haulage. • Direct access to Tweed Valley Way Pacific Highway Interchange in the form of ~~an acceleration lane and merge~~ a roundabout will be provided. • ~~Upgrades to the existing ABLP priority intersection including a new left turn auxiliary will be provided.~~ • Upgrades to Tweed Valley Way western roundabout in the form of lane widening will be provided. • HTSP must not transport more than 950,000 tonnes of extractive material from the Site in any financial year. • ~~ABLP Property priority intersection to be used as left in access only for the TSP traffic.~~ • ~~Exit only access is to be obtained via the Tweed Valley Way offramp including the new acceleration lane.~~ • Truck haulage route to be in accordance with Figure 7.6 of the TIA under Appendix J. <u>Management Plan</u> • An Operational Traffic Management Plan / Driver Code of Conduct will be developed and implemented.	-
LAND RESOURCE			
Land Resources (Contamination)	Areas of potential contamination have been identified on Site and my impact the site suitability for the proposed land use.	<u>Prescriptive Measures</u> • a DSI to inform the preparation of a RAP will be undertaken. Remediation will be undertaken in accordance with the RAP on a lot-by-lot basis prior to extraction within that allotment.	-

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
Land Resources (Acid Sulfate Soils)	Exposure of Acid Sulfate Soils to receiving environments	<u>Prescriptive Measures</u> • Topsoil's and overburden will be analyzed and where required, treated through the addition of lime to neutralize net acidity. • Fines material shall be discharged into the dredge lake at a depth of greater than 3 meters below the surface water level and shall achieve a final deposition depth of at least 8 metres below the water surface level. <u>Management Plan</u> • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. <u>Monitoring and Reporting</u> • Monitoring and report will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	-
Land Resources (Agricultural Land)	The loss of Agricultural Land.	<u>Prescriptive Measures</u> • Until an extraction phase comes online, the project would maintain cattle grazing and agistment.	• There remains a progressive loss of Agricultural Land.
Land Resources (Landform and Stability)	The creation of unstable lake banks and associated impact to surrounding land and infrastructure	<u>Prescriptive Measures</u> • All earthworks' operations should be carried out in general accordance with AS 3798-2007 "Guidelines on Earthworks for Commercial and Residential Developments". • All topsoil (i.e. soil containing organic matter) and soils containing deleterious matter should be stripped from the construction area at the commencement of the earthworks operation. • The use of a bridging layer may be required to improve trafficability across the Site. Subject to the subgrade performance at the time of bulk earthworks. The bridging layer is likely to be a minimum 400mm thick and the use of a suitable woven geofabric may assist in minimizing the required layer thickness. • Imported fill should be of fair to good quality with a minimum Soaked CBR value of 10%, a maximum Iss=1.0% and a maximum particle size of 75mm. • All filling should be undertaken in layer thicknesses of approximately 250mm (or as appropriate for the compaction equipment being used). Fill should be compacted to a minimum dry density ratio of 98% Standard in accordance with AS1289 5.1.1. • Field density testing should be carried out to check the standard of compaction achieved and the placement moisture content. The frequency and extent of testing should be as per guidelines in AS.3798-2007. • All earthworks' operations should be performed under Level 1supervision, in general accordance with the requirements of AS3798 and should be certified as controlled fill by the testing authority. <u>Monitoring and Reporting</u> • Underwater survey of bater profiles is to be undertaken.	• Potential exists for application of additional loads being applied to the top of the embankment slope or over dredging of sand batters during operations
WASTE			
Waste	Waste streams generated by the proposal can impact the environment	<u>Prescriptive Measure</u> • Effluent (from staff amenities) is to be disposed of onsite via an onsite effluent disposal system. The system is to be installed / operated in accord with any requirement of an EPL and S68 Approval under the Local Government Act 1993.	-

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
		• All liquid storage (other than water) is to be protected by bunding or other containment in accordance with relevant Australia Standards. • General and Liquid Waste is to be collected and transported by appropriately licensed waste contractor to a facility with the correct permits for handling and processing the waste form. • Fines material shall be discharged into the dredge lake at a depth of greater than 3 meters below the surface water level and shall achieve a final deposition depth of at least 8 metres below the water surface level. • Overburden is to be reused onsite to the extent practical. **Management Plan** • A soil and water management plan will be developed and implemented. This soil and water management plan will be consistent with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021. **Monitoring and Reporting** • Monitoring and report will be undertaken in accord with the Draft Soil and Water Management Plan prepared by Gilbert and Sutherland dated February 2021.	
HAZARD			
Hazards (Flood)	The Site is flood prone and operations on Site represent a potential risk to life and property during extreme flood events.	**Management Plan** • A Flood Response Assessment plan will be developed and implemented. This plan will be consistent with the Flood Response Assessment plan prepared by Burchills Engineering Solutions dated February 2021.	-
Hazard (Bushfire)	Most of the Site is not identified as bushfire prone land. There are however patches of vegetation land on the periphery of the Site that is mapped as bushfire prone. The Rural Fires Act 1997 and Associated Planning for Bushfire Protection 2019 do not identify the project as a development type that must be considered for bushfire risk.	**Prescriptive Measure** • The Site will be subject to ongoing cattle agistment to ensure paddocks are kept in a maintained state.	-
Hazards (Consumables)	Exposure of incorrectly stored consumable to receiving environments	**Prescriptive Measures** • All liquid storage (other than water) is to be in vessel compliant with the relevant Australian Standards. • All liquid storage (other than water) is to be protected by bunding or other containment in accordance with relevant Australia Standards.	-
VISUAL			
Visual	The project will change the established	**Performance Criteria**	The project will result in a permanent change to the established landscape character.

<table>
<tr><th>ISSUE</th><th>POTENTIAL IMPACT</th><th>APPROACH</th><th>RESIDUAL IMPACT</th></tr>
<tr><td></td><td>landscape character with potential negative impact to visual quality</td><td>
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>All areas of the Site affected by the development</td><td>• Safe
• Hydraulically and geotechnically stable, including the dredge pond margins (particularly where subject to regular wind and wave action)
• Non-polluting
• Fit for the intended post-mining land use(s)
• Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimizing visual impacts when viewed from surrounding land</td></tr>
<tr><td>Surface Infrastructure</td><td>Decommissioned and removed, unless otherwise agreed by the Secretary</td></tr>
<tr><td>Dredge Pond and Final Lake</td><td>• Perimeter of dredge pond landscaped and vegetated using native tree and understory species.
• Natural looking bank design with curved lake boundaries, with a variety of bank treatments (e.g., beaches, wetlands) providing a variety of habitats.
• Minimize the extent and persistence of algal blooms
• Water quality fit for the intended post-mining land use(s)</td></tr>
</table>
<u>Management Plan</u>

A Rehabilitation Management Plan will be developed and implemented. This plan will be consistent with the concept rehabilitation and landscape management plan prepared by JWA Ecological Consultants dated ~~March~~ October 2021 and will:

(a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary.
(b) be prepared in consultation with DPIE, Council and OEH.
(d) include a detailed final landform concept plan showing the final lake and bank design.
(e) describe how the rehabilitation of the Site would achieve the above performance criteria.
(f) describe the short, medium, and long-term measures that would be implemented to:
• rehabilitate and stabilize the Site; and
• manage the restored vegetation and wetland habitat established on the Site.
(g) include detailed performance and completion criteria for the rehabilitation and stabilization of the Site (including appropriate water quality criteria);
(h) include a detailed description of the measures to be implemented on the Site to:
• enhance existing vegetation and increase littoral and terrestrial habitat potential.
• control terrestrial and aquatic pests and weeds.
• control erosion.
• control access; and
• reduce the visual impacts of the development.
(i) include a vegetation clearance protocol.
(j) include a program to monitor, independently audit and report on the effectiveness of the measures in paragraph (f) above, and progress against the detailed performance and completion criteria in paragraph (g) above; and
(k) include a Long-Term Management Strategy which:
• defines the objectives and criteria for HTSP closure and post-extraction management.
• describes the measures that would be implemented to minimize or manage the ongoing environmental effects of the project; and
• describes how the performance of these measures would be monitored over time.
(l) describe the potential risks to successful rehabilitation and/or revegetation, including a description of the contingency measures that would be implemented to mitigate these risks; and
(m) detail who is responsible for monitoring, reviewing, and implementing the plan.
</td><td></td></tr>
<tr><td colspan="4">SOCIAL</td></tr>
<tr><td>Social</td><td>• Interaction with heavy vehicles on local roads
• Construction dust
• Operational dust</td><td>• Measures to mitigate social impact are identified within the specific issue.</td><td>• Residual impacts are identified within the specific issue</td></tr>
</table>

ISSUE	POTENTIAL IMPACT	APPROACH	RESIDUAL IMPACT
	• Construction and operation noise • Change to the visual landscape (Visual amenity) • Cost legacies at end of the project		
		ECONOMIC	
Economic	-	-	-
		CUMULATIVE IMPACTS	
Cumulative Impacts	Despite the project being in proximity to other extractive land uses there will be no significant cumulative risks because of the proximity of the project to these operations. All technical assessments of the potential impacts of the project, have where relevant, considered the cumulative impacts of the development combined with existing activities in the area thereby assessing the cumulative impacts of the project. Other land uses near HTSP, including other extractive industries, will be subject to hazard related consent and EPL conditions. As such, hazards and risks associated with these facilities are likely to be managed in an environmentally responsible manner and in accordance with relevant legislation and standards, thereby minimizing the potential for cumulative impacts from the project combined with nearby facilities.	• Measures to mitigate cumulative impact are identified within the specific issue.	-
		REHABILITATION	

<table>
<tr><th>ISSUE</th><th>POTENTIAL IMPACT</th><th>APPROACH</th><th>RESIDUAL IMPACT</th></tr>
<tr>
<td>Rehabilitation</td>
<td>At the completion of extraction, the Site is left in a negative legacy state.</td>
<td>
<u>Performance Criteria</u>
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>All areas of the Site affected by the development</td><td>• Safe
• Hydraulically and geotechnically stable, including the dredge pond margins (particularly where subject to regular wind and wave action)
• Non-polluting
• Fit for the intended post-mining land use(s)
• Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimizing visual impacts when viewed from surrounding land</td></tr>
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<tr><td>Dredge Pond and Final Lake</td><td>• Perimeter of dredge pond landscaped and vegetated using native tree and understory species.
• Natural looking bank design with curved lake boundaries, with a variety of bank treatments (e.g., beaches, wetlands) providing a variety of habitats.
• Minimize the extent and persistence of algal blooms
• Water quality fit for the intended post-mining land use(s)</td></tr>
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<u>Management Plan</u>

A Rehabilitation Management Plan will be developed and implemented. This plan will be consistent with the concept rehabilitation and landscape management plan prepared by JWA Ecological Consultants dated ~~March~~ October 2021 and will:

(a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary.
(b) be prepared in consultation with DPIE, Council and OEH.
(d) include a detailed final landform concept plan showing the final lake and bank design.
(e) describe how the rehabilitation of the Site would achieve the above performance criteria.
(f) describe the short, medium, and long-term measures that would be implemented to:
• rehabilitate and stabilize the Site; and
• manage the restored vegetation and wetland habitat established on the Site.
(g) include detailed performance and completion criteria for the rehabilitation and stabilization of the Site (including appropriate water quality criteria);
(h) include a detailed description of the measures to be implemented on the Site to:
• enhance existing vegetation and increase littoral and terrestrial habitat potential.
• control terrestrial and aquatic pests and weeds.
• control erosion.
• control access; and
• reduce the visual impacts of the development.
(i) include a vegetation clearance protocol.
(j) include a program to monitor, independently audit and report on the effectiveness of the measures in paragraph (f) above, and progress against the detailed performance and completion criteria in paragraph (g) above; and
(k) include a Long-Term Management Strategy which:
• defines the objectives and criteria for HTSP closure and post-extraction management.
• describes the measures that would be implemented to minimize or manage the ongoing environmental effects of the project; and
• describes how the performance of these measures would be monitored over time.
(l) describe the potential risks to successful rehabilitation and/or revegetation, including a description of the contingency measures that would be implemented to mitigate these risks; and
(m) detail who is responsible for monitoring, reviewing, and implementing the plan.
</td>
<td>-</td>
</tr>
</table>

7.0 Updated Project Evaluation

The project will enable continued extraction of a resource in high demand, which supports the construction industry. The project will deliver economic benefits to both NSW and Tweed regions, will support local economic activity and employment through both the construction and operational phases. The economic and social impact analysis of the project demonstrates that it will be socio-economically beneficial to NSW and Local Tweed community.

The project will not result in significant residual impacts on most environmental aspects, including amenity impacts associated with noise and air quality. Similarly, the project is not anticipated to result in significant social impacts as assessed with the social impact assessment.

The project will have residual impacts on:

- Terrestrial biodiversity. This will result from the progressive loss of 3.66ha of native vegetation and 2.06ha of land required to be rehabilitated under existing approvals. This vegetation loss will be offset in accordance with NSW policy, with credits being calculated in accordance with the BAM method. This offsetting will have the benefit of protecting areas of similar native vegetation communities into perpetuity. This 5.72ha loss will also be offset via the progressive rehabilitation of approximately 38.21ha of land on the project site.

- Pre-development groundwater flows. Localized and minor changes to pre-development groundwater flow regimes will occur in the vicinity of the extraction lakes. These changes will however be largely contained within the development footprint.

- Changes to groundwater elevation. These are predominantly contained within the development footprint with minimal change occurring outside of the site boundary as a result of the TSP expansion. Residual impacts are summarised as follows:

    - There is a maximum 0.5 m lowering of the water table in the northern portion of the expansion area. The impact is predominantly contained within the expansion footprint, however a decrease in groundwater elevation of up to 0.3m is predicted within a small portion of the lands outside the northern perimeter of Lot 51 on DP1166990.

    - With respect to the Low Potential GDE (Drawing No. 12035-501) adjacent the southern boundary of the expansion footprint west of Lot 1 on DP1250570. The revised groundwater model incorporates an increased buffer distance of ~50 m between the limit of extraction and the site boundary. Whilst groundwater drawdown is still predicted to occur within this area the increased buffer distance has reduced the lateral extent of offsite drawdown from 170 m to 155 m and reduced the magnitude of drawdown to between 0.1 m and 0.5 m. The footprint of offsite drawdown in this area has reduced by ~4,300 m2.

    - As the change in groundwater table predicted in this area is within the range of natural seasonal fluctuation, it is unlikely that the swamp sclerophyll forest (*Casuarina Glauca*) present in this area will experience negative impacts as a result of the localized change in groundwater conditions.

- Local hydraulic regime. Some hydraulic impacts that are marginally outside of the allowable impact thresholds located in the Chinderah Township. These impacts however are short lived (occurring for only a three-year period during Phase 7), and as the Lakes take their ultimate form (Phase 11) become acceptable. Increases in peak flood level are primarily caused by a loss of floodplain storage.

- Local hydraulic regime. Changes in inundation time will occur to a pair of properties located between the M1 and Tweed Valley Way, properties in this area will experience a nominal increase in time of inundation.

- Agricultural Land. The project will result in the progressive permanent loss of Agricultural Land. Assessment of the agricultural capability of the land indicates it is marginal. Groundwater modelling indicates this capability will continue to decline as groundwater levels rise and inundation from sea level rises due to climate change impede drainage and waterlog soils. I.e., the Agricultural land will be lost in any event.

- Visual Amenity. The project will result in a change to the existing landscape character and on completion of extraction works and subsequent final rehabilitation phases, the Project Site will present as a natural lake bordered by significant vegetation to its perimeter. This change in landscape character would not adversely impact key significant landscape features of the locality.

Assessment of the project against the matters for consideration under the Environmental Planning and Assessment Act 1979 demonstrates the project:

- Is permissible with consent.
- Is consistent with the objects of the Act.
- Is generally consistent with relevant EPI's.
- Is generally consistent with strategic and forward planning strategies applicable to the locality and region.
- Has considered and been formulated consistent with the principles of Ecologically Sustainable Development.
- Most project impacts can be addressed with appropriate mitigation measures.
- Residual impacts are largely contained within the development footprint and impact to adjoining sensitive receivers is minimal; and
- Is the highest and best use of the Site.

The proposal is suitable and in the public interest when considered holistically as:

- It efficiently meets the project needs and objectives.
- The project has been formulated on a precautionary approach to analysis, assessment and management of impacts and risks to the environment.
- The project mitigation measures are based on long-term site data that demonstrate the proposed mitigations measures work on the Site in real world scenarios.
- It does not result in social and inter-generational equity issues.
- Biodiversity and ecological impacts are appropriately offset.
- HTSP's current environmental management approach has proven effective over time with respect to risk reduction, hazard mitigation and protection of the receiving environment.
- HTSP is committed to achieving a stable landform with water quality at the Site within an acceptable range to facilitate a wide range of end use scenarios.
- The proposed environmental management plans incorporate the intent of the precautionary principle. Implementation of the monitoring and management measures specified in these management plans will allow these goals to be achieved.
- The economic and social impact analysis of the project demonstrates that it will be socio-economically beneficial to NSW and Local Tweed community.

The project is warranting of support and development consent can be granted.

8.0 References

N/A