TWEED SAND PLANT ECONOMIC ASSESSMENT

Hanson Construction Materials Pty Ltd

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Tweed Sand Plant Economic Assessment
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EXECUTIVE SUMMARY

Tweed Sand Plant owned by Hanson Construction Materials Pty Ltd ("Hanson") extracts high quality fine sand for use in premixed concrete production and general construction use. The plant located off Altona Road in Cudgen, Northern NSW, has been operational since 1983, with Hanson assuming ownership in 2007. Tweed Sand Plant operates under a current approval that allows a maximum 500,000 tonnes of quarry products to be transported from site in any financial year. Hanson intends to expand its Tweed Sand Plant operation to extract and process up to 950,000 tonnes of sand per annum.

As part of the approvals for this expansion, an Economic Impact Assessment is required to input into and answer questions as part of the wider Environmental Impact Statement for the project. The EIA is governed by the NSW Department of Planning, Industry & Environment Planning Secretary's Environmental Assessment Requirements.

Demographic and Socio-Economic Profile

- The Tweed region has a population of 97,000 in 2019, having increased at an average annual rate of 1.2% over the last decade. The population is projected to grow to 109,487 people by 2031 at an average annual rate of 0.8% over the next decade.
- There is a significant aging population in the LGA with over 30% the population aged 65+ years compared to the NSW benchmark share of 17%. Share of population aged 65+ years is expected to continue to grow to 31% by 2036.
- In 2016, the Tweed LGA ranked in the 5th Decile within NSW in the IRSAD. The median weekly household income was $679 compared to the state average of $891.
- The unemployment rate was most recently recorded at 3.8% in March 2020, compared to the state average of 4.6%.

Local Area Labour Assessment

- Kingscliff-Fingal Head SA2 is home to both the Tweed Sand Plant and over 15,100 residents.
- The area is home to a diverse labour force, which includes a higher proportion of residents working in the construction sector than both the Tweed and NSW labour forces.
- The Gold Coast features prominently as an employment destination for many Tweed and Kingscliff-based construction workers, with over 800 Tweed construction workers travelling to the Gold Coast – this accounts for 1 in every 5 construction workers living in the Tweed LGA.

Sand Market Profile and Demand

- The Queensland market saw a significant rise in sand demand in 2019, reaching the highest level since 2008.
- There is only a small number of sand plants and resources to the south of Brisbane, with the Tweed Sand Plant currently playing an important role servicing both the Gold Coast and northern NSW markets.
- Demand for sand is expected to be supported by three factors:
  - Regional population growth;
  - Major infrastructure projects in South East Queensland and Northern NSW; and
  - Export demand into Queensland (namely South East Queensland).

Economic Impact Assessment

- RPS has assessed the expenditure based economic impacts and contributions of the proposed expansion project using regionalised input-output economic multipliers.
- Adjustments have been made to address methodological concerns and criticisms through the use of a regionalised (NSW and Tweed) model and the presentation of Simple economic multipliers only.

- The results show that during the Construction/Establishment phase of the expansion, the project will generate $21.6m in output, $5.7m in Income, 43 jobs (direct and in first round supply chains) and $9.4m in Gross Value Added for NSW.
- Operational activity (post expansion at full production capacity) will generate $6.3m in economic output, $1.7m in incomes, 18 jobs (direct and in first round supply chains) and $3.0m in Gross Value Added annually for NSW.
- Tweed LGA will capture the lion's share of impacts on the NSW economy, accounting for 92.4% of Construction phase GVA and 89.9% of Operational Phase GVA.

Cost Benefit Assessment

- RPS has undertaken a cost benefit assessment of the Tweed Sand Plant expansion in line with TPP17-03 NSW Guide to Cost Benefit Analysis.
- A cost of capital approach has been adopted (i.e. excluding operational costs except expansion linked maintenance) and revenues have been excluded through the use of Gross Value Added estimates on all economic benefits.
- Consideration has been given to the indirect cost of the loss of agricultural output on the subject site.
- Additionally, a range of benefits have been assessed including:
  - Construction/Establishment Phase Supply Chains
  - Export Values (Gross Value Added)
  - Share of the GVA of Construction Activity Supported in NSW by the Resource.
  - Residual Resource Value (Gross Value Added)
- The results of the assessment indirect a net present value ranging from $24.0m over 20 years at 10% to $91.3m at 3%.
- Similarly, the benefit cost ratios of the expansion exceeds 2.0 under all scenarios – ranging from 2.9 under 10% to 6.3 under 3%.

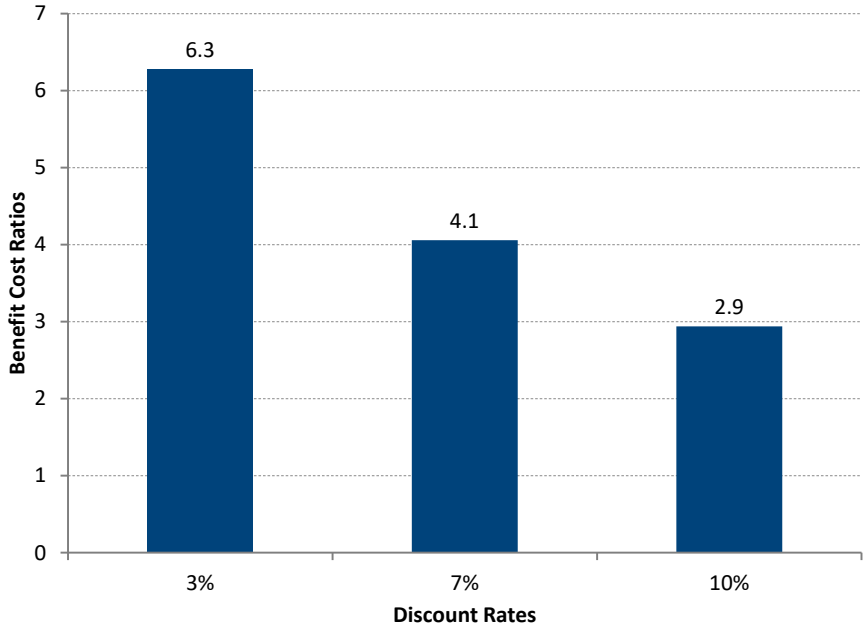

Figure 1 Benefit Cost Ratios, by Discount Rate, Tweed Sand Plant Expansion, 2020 to 2041

- A sensitivity test increasing the NSW share of sand plant production from 5% to 20% (i.e. reducing export shares to 80%), resulted in a marginal increase in BCRs across all discount rates, confirming that the economic contributions of the sand produced at the plant are similar whether it is used as a local construction material input or exported.

- This reflects the increasingly integrated nature of the Tweed economy with that of the Gold Coast – an integration which is identified as a critical opportunity for the region in the Tweed Regional Plan.

Conclusions

- The expansion of the Tweed Sand Plant represents a significant opportunity for the Tweed and NSW economy to leverage local, regional and interstate population, development and infrastructure investment and growth to increase exports while ensuring the security of supply of critical local construction materials for the Tweed LGA.
- The expansion of the Plant and the establishment of an increased extraction cap will address short-term resource availability issues expected to emerge later this decade, while also providing local employment, establishment and operational phase supply chain benefits for local businesses and indirectly support the region's construction workforce.
- The project is expected to generate a positive benefit cost ratio across all discount rates and produce a positive net present value contribution to the Tweed and NSW economies.
- The resources available on the subject site will continue to be available for extraction post the assessment period of this economic evaluation. However, at a future point, the resource will become exhausted and the Tweed Sand Plant will cease to function.
- The current commitment of Hanson is for the full environmental rehabilitation of the site and its retention for use for a potential range of commercial and/or recreational activities. The nature and viability of these potential end uses will be examined in further detail closer to the end date of the extraction operations and may be subject to additional planning approvals to support further employment generating economic opportunities on the site.

1 INTRODUCTION

This section provides an overview of the structure and content for the Economics Impact Assessment (EIA) and Cost Benefit Analysis (CBA) report.

1.1 Background and Context

Tweed Sand Plant owned by Hanson Construction Materials Pty Ltd ("Hanson") extracts high quality fine sand for use in premixed concrete production and general construction use. The plant located off Altona Road in Cudgen, Northern NSW, has been operational since 1983, with Hanson assuming ownership in 2007.

Tweed Sand Plant operates under a current approval that allows a maximum 500,000 tonnes of quarry products to be transported from site in any financial year.

Hanson intends to expand its Tweed Sand Plant operation to extract and process up to 950,000 tonnes of sand per annum.

1.2 Project Purpose

As part of the approvals for this expansion, an Economic Impact Assessment is required to input into and answer questions as part of the wider Environmental Impact Statement for the project. The EIA is governed by the NSW Department of Planning, Industry & Environment Planning Secretary's Environmental Assessment Requirements and needs to, as a minimum, demonstrate:

- The significance of the resource – its contribution to regional production over the next 30 years and potential to address any emerging supply gaps and shortages in the market;
- The costs and benefits of the project – in the form of a quadruple bottom line cost benefit assessment;
- The project will generate a net benefit to NSW – based on the results of the net present values and benefit cost ratios as well as the contributions to Gross Regional Product;
- The demand on local infrastructure and services – namely road transport infrastructure associated with product distribution; and
- The economic impact due to the loss of agricultural land – based on an alternative use, as valued in the cost benefit assessment.

1.3 Report Scope

RPS was engaged to prepare a Social and Economic Impact Assessment of the Precinct. This Assessment Report includes the following key sections:

- **Introduction** – overview of the project background, purpose, structure and study area;
- **Tweed Demographic and Socio-Economic Profile** – profile of key attributes of the population and economy of the Tweed to inform employment, economic and social impacts;
- **Local Labour Force Profile** – profile of the local population and labour force characteristics of the people living in the Kingscliff-Fingal Head SA2 including their links to construction sector employment in the Tweed and in the Gold Coast LGA;
- **Sand Production Profile and Projections**– profile of the current sand plant production in northern NSW and southern Queensland including the subject site and other plant sites across the area. Identification of the drivers of demand and an outline of the projected profile of demand for the Tweed Sand Plant.
- **Employment and Economic Impact Assessment** – an input-output multiplier-based employment and economic impact assessment of construction/establishment and operational phases of the project;
- **Cost Benefit Assessment** – summary of high level cost benefit analysis of the triple bottom line (economic, social and environmental) benefits from the project over a 20 year period at formal discount rates; and

- **Conclusion** – summary of key conclusions of the assessment.

1.4 Statistical Geography

For the purposes of this assessment, RPS has defined the Study Area as the Tweed Shire Council Local Government Area (LGA). Additionally, economic impact and cost benefit assessments are based on the economic values of the expansion for NSW.

Figure 2 Tweed Shire Council LGA (and Subject Site)

1.5 Glossary and Abbreviation

The following terms and abbreviations are used in this report.

Terms and Abbreviations	Description
ABS	Australian Bureau of Statistics
BCR	Benefit Cost Ratio
EIA	Economic Impact Assessment
ERP	Estimated Resident Population
GRP	Gross Regional Product
GVA	Gross Value Added
LGA	Local Government Area
LQ	Location Quotient
MCA	Multi-Criteria Analysis
NIEIR	National Institute of Economic and Industry Research
SA2	Statistical Area 2
SEIA	Social and Economic Impact Assessment
SEIFA	Socio-Economic Index for Advantage
SIA	Social Impact Assessment

2 DEMOGRAPHIC AND SOCIO-ECONOMIC PROFILE

This section profiles the population and economic composition of the Tweed region.

Key Findings

- The Tweed region has a population of 97,000 in 2019, having increased at an average annual rate of 1.2% over the last decade. The population is projected to grow to 109,487 people by 2031 at an average annual rate of 0.8% over the next decade.
- There is a significant aging population in the LGA with over 30% of the population aged 65+ years compared to the NSW benchmark share of 17%. Share of population aged 65+ years is expected to continue to grow to 31% by 2036.
- In 2016, the Tweed LGA ranked in the 5th Decile within NSW in the IRSAD. The median weekly household income was $679 compared to the state average of $891.
- The unemployment rate was most recently recorded at 3.8% in March 2020, compared to the state average of 4.6%.

2.1 Population and Age Profile

The Tweed Local Government Area (LGA) had an Estimated Resident Population (ERP) of 97,001 persons in 2019. The Tweed LGA has experienced consistent growth over the last decade, with its population increasing at an average annual rate of 1.2%. Future growth is not expected to exhibit the positive trends of past growth; for the period between 2020 and 2031 the population is projected to grow at an average annual rate 0.8%. The total growth rate over the stated period is expected to be 12.6%, seeing the population grow from 98,457 people to 109,487. The subdued growth exhibited from 2020 will persist over the study period. From 2031 to 2041 the population is only expected to increase by 0.4% per annum. Figure 3 illustrates both the historic and project population growth for the Tweed LGA.

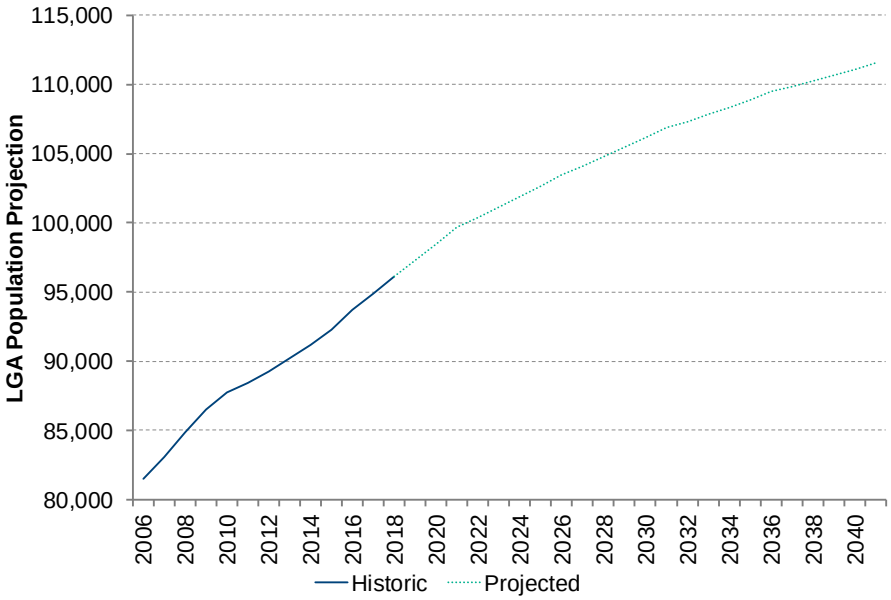

Figure 3 Historic and Projected Population, Tweed LGA, 2006 - 2041[1]

The strongest growing age brackets of the Tweed region is that of the ages of 65 years and over. All age brackets below 65 years are experiencing negative growth in at least one five-year block within the study period. The 65 years old and over category is the only category expected to experience consistent growth, regularly upwards of 5% per annum. The disproportionate growth within the over 65 years category will mean by 2028, around 30% of LGA residents will be aged over 65.

Currently, the LGA already has significantly lower levels of young people, aged below 34, compared to the New South Wales average. This age bracket accounts for 59% of the total New South Wales population but only 47% of the LGA's. Of people aged below 65, the 25-34 age bracket displays the largest deviation from benchmark levels; this bracket makes up 9% of the Tweed's total population and 15% of New South Wales'.

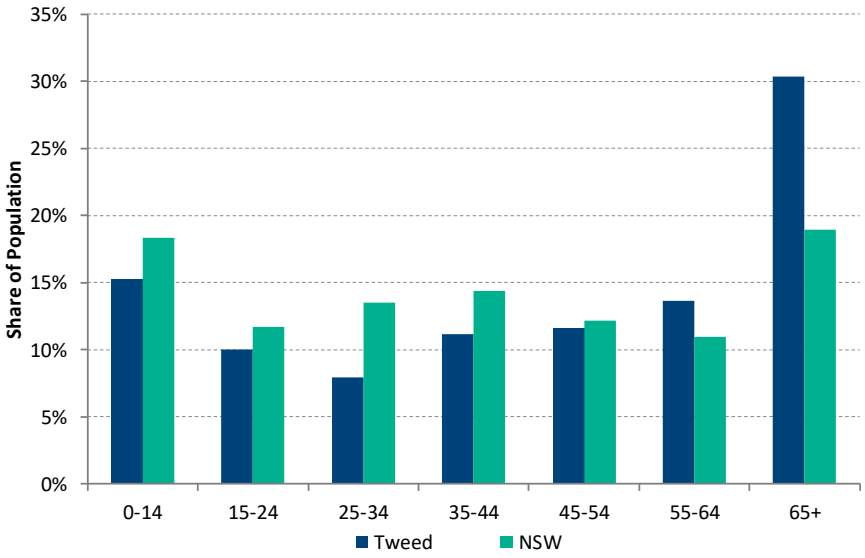

Figure 4 Age Profile, Tweed LGA and New South Wales, 2018[2]

The largest overall deviation is in the over 65 year age bracket, currently accounting for 30% of the LGA population but only 17% of New South Wales benchmark. The growth in residents aged over 65 is expected to increase strongly, averaging 2.8% from 2016 to 2026 and 2.2% from 2026 to 2036. Estimates indicate by 2031 that 33,423 people will be aged over 65, equivalently 31% of the population.

[1] DPIE (2020) Population Projections, NSW Department of Planning, Industry and Environment

[2] ABS (2020). Regional Population by Age and Sex, Cat. No. 3235.0, Australian Bureau of Statistics

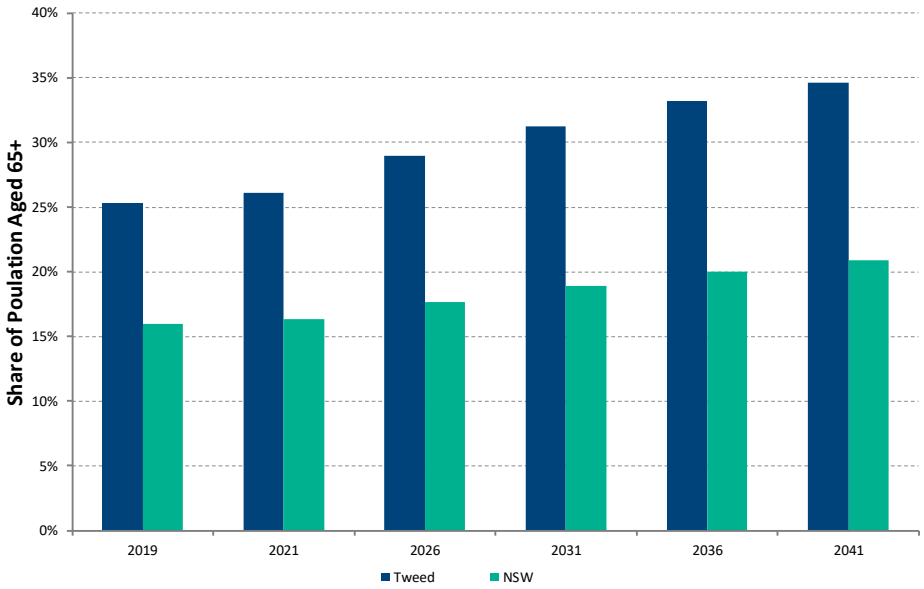

Figure 5 Share of Population Aged 65+, Tweed LGA and New South Wales, 2019-2041

The significant ageing occurring in the Tweed region has implications for the regional economy like reduced job participation rates, which will be further exacerbated by low levels of younger working aged people.

2.2 Socio-Economic Profile

Socio-Economic Indexes for Areas (SEIFA) is a range of four indexes produced by the ABS to summarise different aspects of socio-economic conditions in different areas. These indexes provide more general measures of socio-economic status than singular indicators such as income and unemployment. The four indexes include:

- **Index of Relative Socio-economic Disadvantage (IRSD):** is derived from Census variables related to disadvantage.
- **Index of Relative Socio-economic Advantage and Disadvantage (IRSAD):** a continuum of advantage (high values) to disadvantage (low values) which is derived from Census variables related to both advantage and disadvantage.
- **Index of Economic Resources (IER)**: focuses on Census variables like the income, housing expenditure and assets of households.
- **Index of Education and Occupation (IEO**): includes Census variables relating to the educational and occupational characteristics of communities.

The information is based off census data and based around a score of 1000 – areas with a score below 1000 are more disadvantaged, and those with a score above 1000 are more advantaged.

From the 2016 Census, the IRSD and IRSAD presents values of 973 and 956, respectively, for the Tweed LGA, indicating a somewhat disadvantaged region. The Tweed LGA is ranked in 6th and 5th decile, respectively, in the state of New South Wales for these indicators. The Tweed LGA is also ranked in the 6th decile for both the IER and IEO. This is summarised in Table 1.

Table 1 SEIFA Scores, Index of Relative Socio-economic Advantage and Disadvantage, 2006[3]

SEIFA	Score	Rank (Decile) within State
IRSD	973	6th
IRSAD	956	5th
IER	985	6th

[3] ABS (2018). Socio-Economic Indexes for Areas (SEIFA), Cat. No. 2033.0.55.001, Australian Bureau of Statistics

SEIFA	Score	Rank (Decile) within State
IEO	989	6th

Median weekly household income in the Tweed LGA has historically been below the state average. However, from 2011 to 2016, household income growth was greater in the Tweed region than the state benchmark. Median weekly household income in Tweed LGA grew from $570 in 2011 to $679 in 2016, a total increase of 19.1%. This is in comparison to New South Wales that grew from $756 to $891 in the same time frame, an increase of 17.9%.

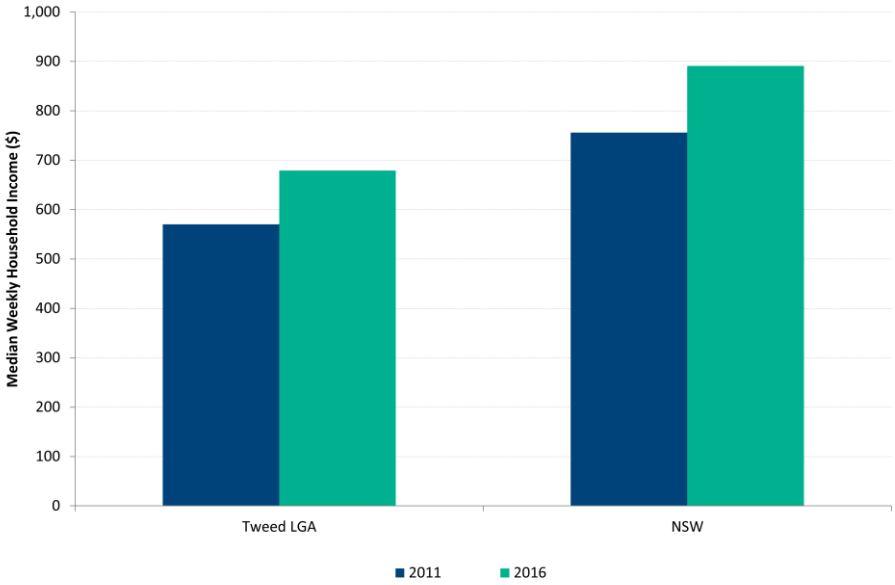

Figure 6 Median Weekly Household Income, Tweed LGA and NSW, 2011 and 2016[4]

The unemployment rate in the Tweed LGA has been more sporadic than the New South Wales overall unemployment over the past decade. From December 2010 to December 2016, the Tweed LGA's unemployment rate remained largely above the state average, peaking at 9.0% in September 2015. Since 2017, the Tweed LGA unemployment rate has fallen below the state average and most recently recorded at 3.8% in the March 2020 quarter, while the state average was 4.6%. Figure 7 below illustrates both the Tweed LGA and New South Wales unemployment rate trend.

[4] ABS (2016). 2016 Census of Population and Housing, Australian Bureau of Statistics

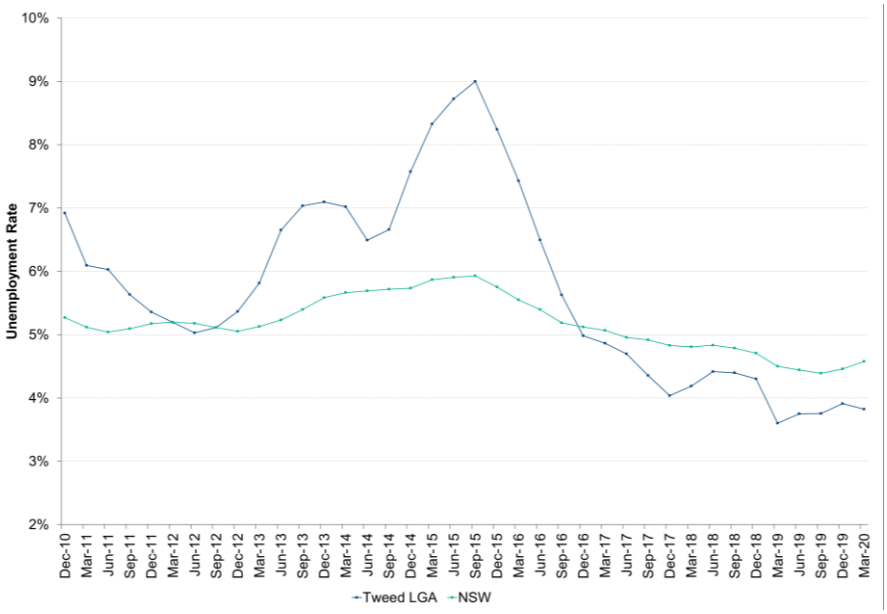

Figure 7 Unemployment Rate, Tweed LGA and New South Wales, 2010 - 2020[5]

2.3 Economic Profile

This section evaluates the Tweed economy by considering its local jobs, industries of employment, the economies overall growth, as represented by Gross Regional Product (GRP) and exports.

2.3.1 Tweed Employment

The number of local jobs indicates the size and direction of growth for an economy. The LGA experienced strong growth in the number of local jobs between 2001 and 2008. Job growth was stifled during the global financial crisis but has seen an uptick since 2015 – growing by an average rate of over 3% per annum. The total number of jobs in the LGA for 2018/19 was 34,254[6]. Figure 8 illustrates the number of local jobs in the LGA from 2001 to 2019.

Since 2001, the number of local jobs within the Tweed LGA has grown at a faster rate than the NSW benchmark. NSW has only experienced an annual average of 1.7% growth, whereas Tweed LGA has grown at an annual average rate of 2.4%. A further indication of increasing economic activity on the LGA is that jobs are growing faster than the local population (1.5%). The strongest growth occurred between 2001 and 2008 where the Tweed LGA growth rate was greater than the NSW average. Since 2008, the annual average rate has largely become aligned. This is illustrated in Figure 9.

[5] DESE (2020). Small Area Labour Markets - LGA, Department of Education, Skills and Employment

[6] NIEIR (2019). Tweed Shire Council: Employment by Industry (Total), economy id

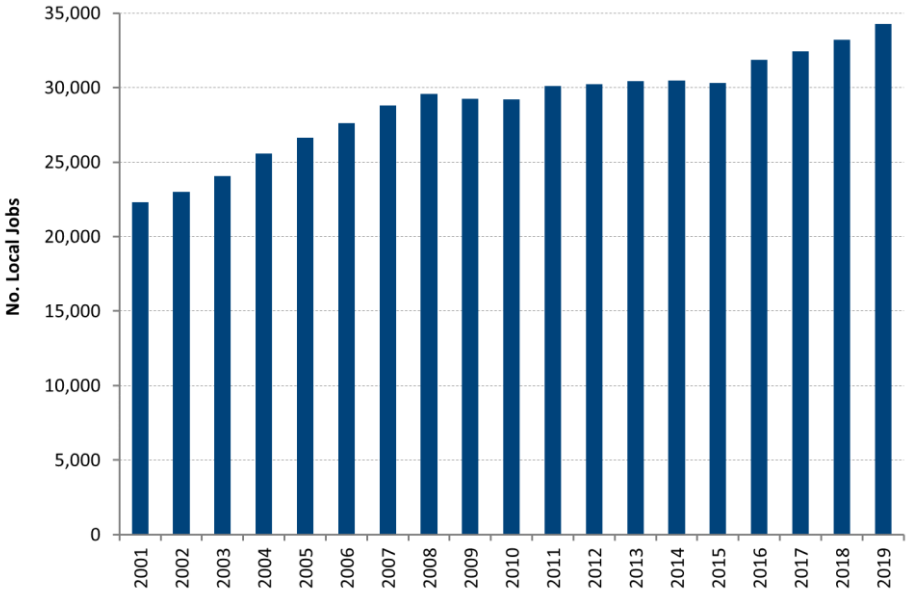

Figure 8 Number of Local Jobs, Tweed LGA, 2011-2019[7]

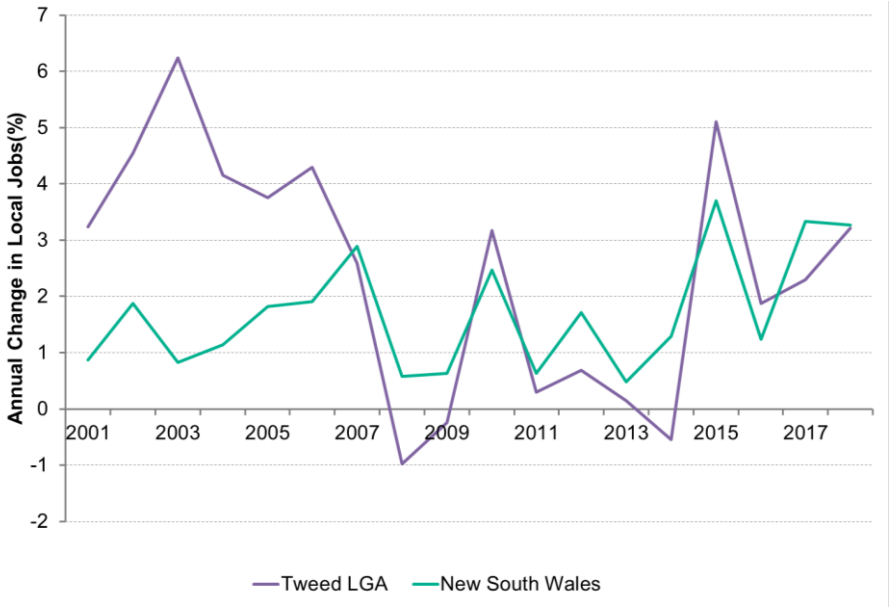

Figure 9 Annual change in Local Jobs. Tweed LGA and NSW, 2001 - 2019[8]

2.3.1.1 Industries of Employment

Employment is heavily concentrated in the Retail Trade and Health Care and Social Assistance industries, which account for over 30% of the jobs in the Tweed LGA. In New South Wales, employment is less concentrated, where the Retail Trade and Health Care and Social Assistance industries account for less than 25% of the state's jobs. Figure 10 shows the top industries by share of employed persons in both the Tweed LGA and the state benchmark.

[7] NIEIR (2019). Tweed Shire Council: Local Employment (Total), economy id

[8] NIEIR (2019). Tweed Shire Council: Local Employment (Total), economy id

Figure 10 Top Industries of Employment, Tweed LGA and NSW, 2018-19[9]

The Tweed LGA has significantly higher proportions of jobs in the Retail Trade, Health Care and Social Assistance and Accommodation and Food Services industries than the New South Wales benchmark. This indicates that the Tweed economy is utilising these jobs to satisfy demand from beyond the region, these jobs will be producing for export demand.

Retail Trade can attract consumers from outside the catchment when it is destination based. Retail has supported 750 new jobs between 2018/19 and 2017/18. Since 2012/13 the number of Retail jobs have increased at 3.8% per year.

Industries like Healthcare may provide specialist practices not found in surrounding regions; necessitating consumers to travel from outside the catchment for goods and services. Health Care and Social Assistance removed 128 jobs in 2018/19. Since 2012/13 this industry has experienced slow job growth, of around 1% per year, which is not uncommon for an industry of its maturity.

The nature of Accommodation in the form of hotels, indicates consumers are unlikely from the region and the services provided are thus exported. The Accommodation and Food Services industry added a net 91 jobs in 2018/19 and has experienced job growth of 1.4% per year since 2012/13.

The Construction industry added a net 99 jobs in 2018/19 and has experienced growth of 2.3% per year since 2012/13. The Tweed Construction sector has supported more than 3,000 jobs since 2015/16 The industry has remained stable over the study period: supporting close to 10% of LGA jobs. These industries are all place based and require built infrastructure to operate.

2.3.2 Location Quotient

Location Quotients (LQs) are used to identify specialised industries within a local economy. Specialisation can be represented by several different measures including employment, output, and export totals. The LQ shows the percentage of the Tweed LGA's economy characteristic divided by the percentage of benchmark area, NSW.

A LQ between 0.8 and 1.2 represents an industry that is broadly similar in importance in the local area compared to the benchmark region. A LQ greater than 1.2 indicates a significant specialisation of the industry in the Tweed LGA compared to the wider benchmark area. It is likely the local economy is providing these extra goods and services from the industry for export markets. If a local industry has a LQ below 0.8. it has proportionally less workers than the benchmark and is likely to be an industry servicing the local economy only.

[9] NIEIR (2019). Tweed Shire Council: Industries of Employment (Total), economy id

In 2018/19, using employment as the measure, the Retail Trade, Accommodation and Food Services, and Agriculture, Forestry and Fishing industries in Tweed LGA showed the highest LQ relative to NSW, representing high specialisation. The three industries with the lower LQ relative to SSW were IT, Financial and Insurance Services and Mining. This is illustrated in Figure 11 below.

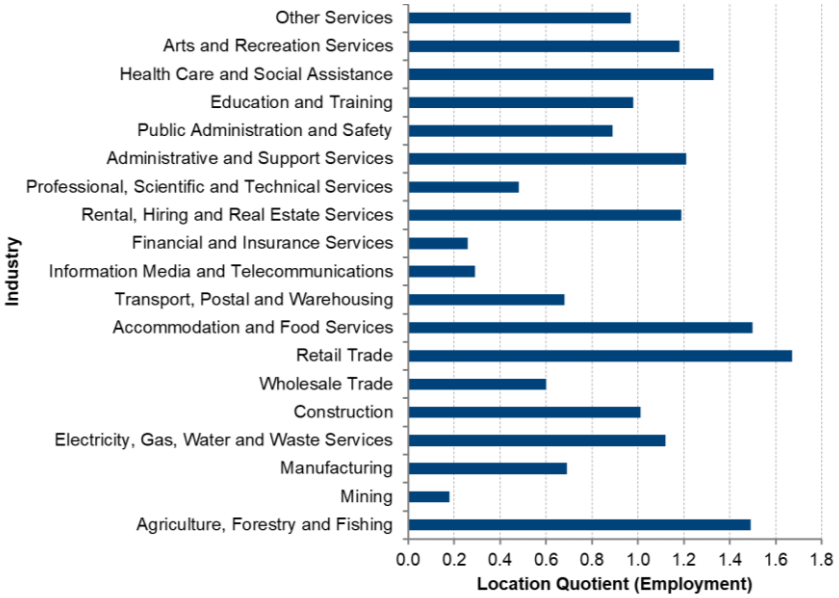

Figure 11 Location Quotient (Employment), Tweed LGA relative to NSW, 2018/19[10]

2.3.3 Business Registrations

The majority of businesses in Tweed LGA are non-employing organisations, with nearly two thirds (62.6%) of businesses operating without any employees, higher than the NSW benchmark of 60.4%. However, there is a smaller proportion of businesses with employees in Tweed relative to NSW. 35.4% of Tweed LGA businesses have between 1 and 19 employees and 2.0% of businesses with between 20 and 199 employees. Only 0.1% of businesses in the Tweed LGA have over 200 employees.

[10] NIEIR (2019). Tweed Shire Council: Location Quotients (Employment Totals), economy id

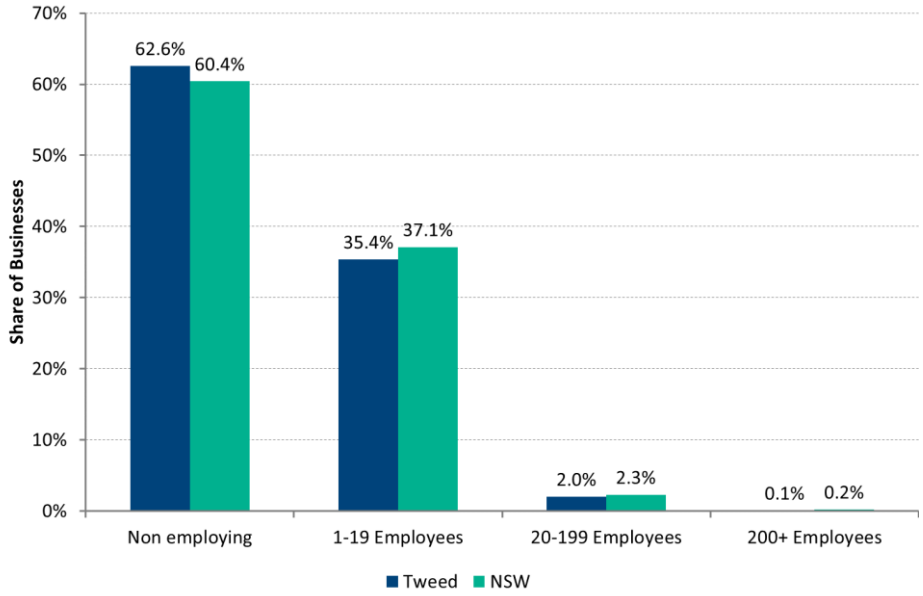

Figure 12 Business Registrations, Tweed LGA and NSW, June 2019[11]

2.3.4 Building Approvals

Building approvals are an important leading economic indicator which provide insight into the level of construction activity within a region. Both residential and non-residential building approvals have fluctuated over the past five years. Residential building approvals have increased significantly since 2012 from $85.2 million to a peak of $252 million in 2017-18. Non-residential building approvals peaked in 2015-16, at $99.7 million. Most recently in 2018-19, 62% of the total dwelling building activity was attributable to new residential approvals.

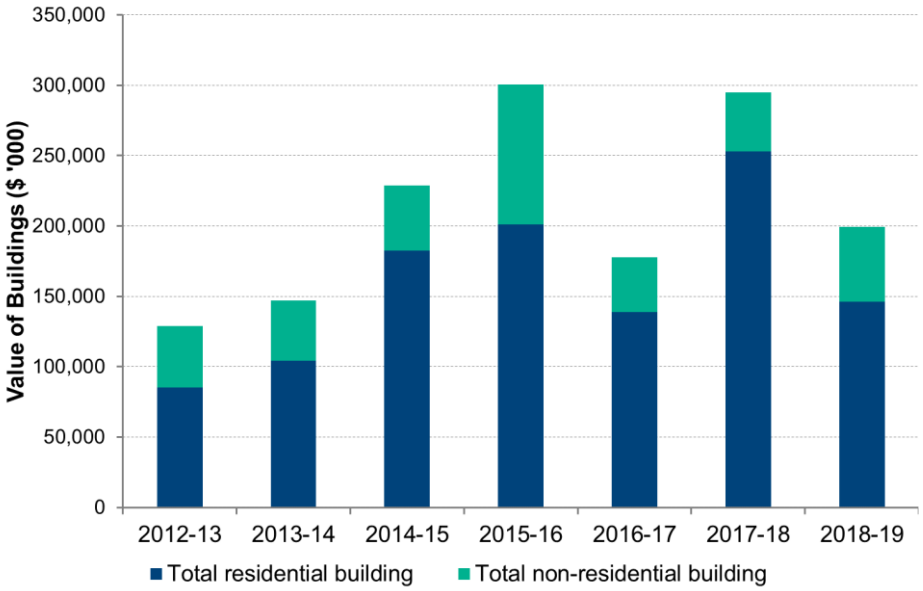

Figure 13 Residential and Non-Residential Building Approvals, Tweed LGA [12]

[11] ABS (2019). Cat. No 8165. Counts of Australian Businesses, including Entries and Exits, Australian Bureau of Statistics

[12] ABS (2016-2019). Residential Building Approvals, Catalog No. 8731.0, Australian Bureau of Statistics

2.3.5 Gross Regional Product and Exports

The Gross Regional Product (GRP) measures the overall economic activity for a region. It is an aggregate figure which helps indicate what direction the economy is moving in, changes in its level are driven by changes in its composition, which includes employment, productivity, and the economies industrial composition.

Tweed's GRP grew strongly from 2001 to 2007 but has since trended flat. Since 2012-13, it has grown at an effective annual rate equal of 0.6%. This indicates that the Tweed LGA economy has been stagnant over the past seven years. In 2018-19, the Tweed LGA headline GRP was $3.75 billion, growing 1.7% since the previous year.

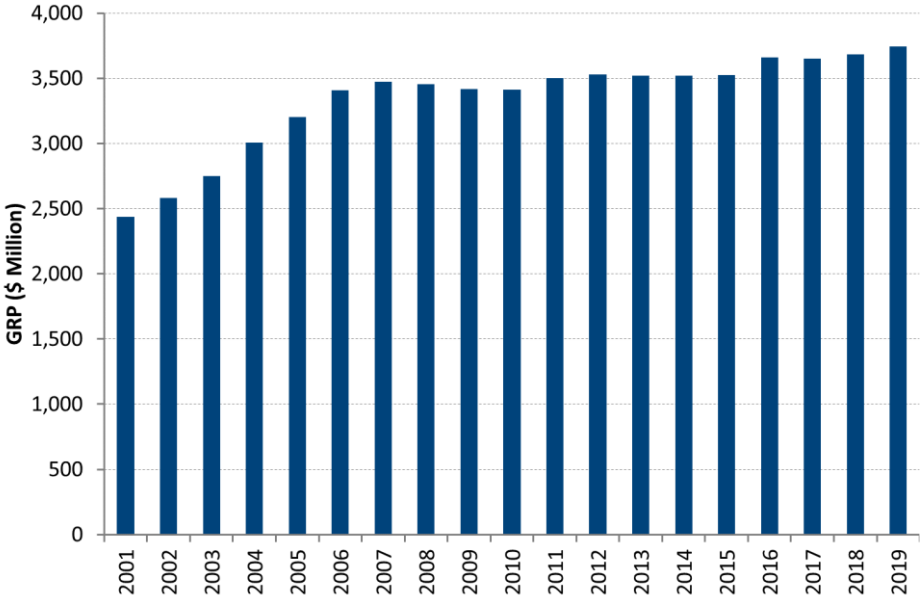

Figure 14 Gross Regional Product (Headline), Tweed LGA[13]

The majority of exports from the Tweed LGA stay within Australia, with 72.7% of exports in 2018-19 within the domestic market. Exports have historically been quite volatile, with a dip to $676.1 million in 2002-03 and peaking again in 2006-07 at $1,114.3 million total exports. Much of the growth was driven by domestic exports growth. Value of exports has since fallen and most recently in 2018-19, domestic exports from Tweed LGA were valued at $687.3 million and international exports were valued at $257.6 million.

[13] NIERIR (2019). Tweed Shire Council: Gross Regional Product, economy id

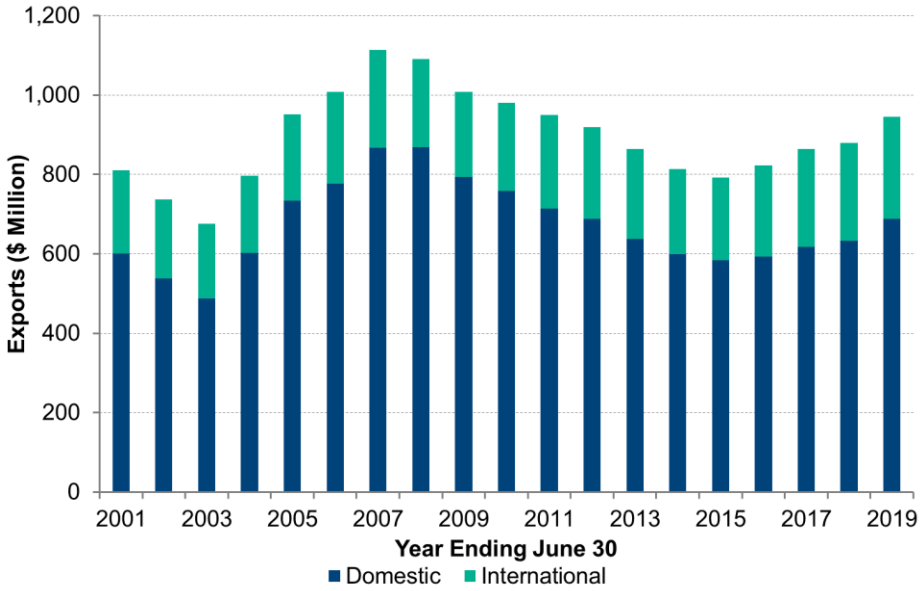

Figure 15 Exports from Tweed LGA, Domestic and International[14]

2.3.6 COVID-19 Economic Impacts

The COVID-19 crisis has had a substantial negative effect on the Tweed LGA economy. The Tweed Shire Council has released the most recent economic forecasts for the June 2020 quarter, demonstrating the impacts from restrictions imposed for public health as well as the effectiveness of the economic policies such as the JobKeeper program.

The Tweed LGA GRP is forecast to fall by -11.1% in the June 2020 quarter, lower than the NSW state average of -14.0%. Local jobs are forecast to fall by -7.9% (2719 jobs). If JobKeeper recipients are included, then the employment fall is estimated at -14.1% (4,815 jobs). The impacts on local jobs have been illustrated in Figure 16, broken down by industry sectors.

The sectors most negatively impacted are Accommodation and Food Services, Retail Trade and Professional and Technical Services. Local jobs in the Health Care and Social Assistance industry has expectedly increased since the COVID-19 crisis.

[14] NIERIR (2019). Tweed Shire Council: Exports (Domestic and International), economy id

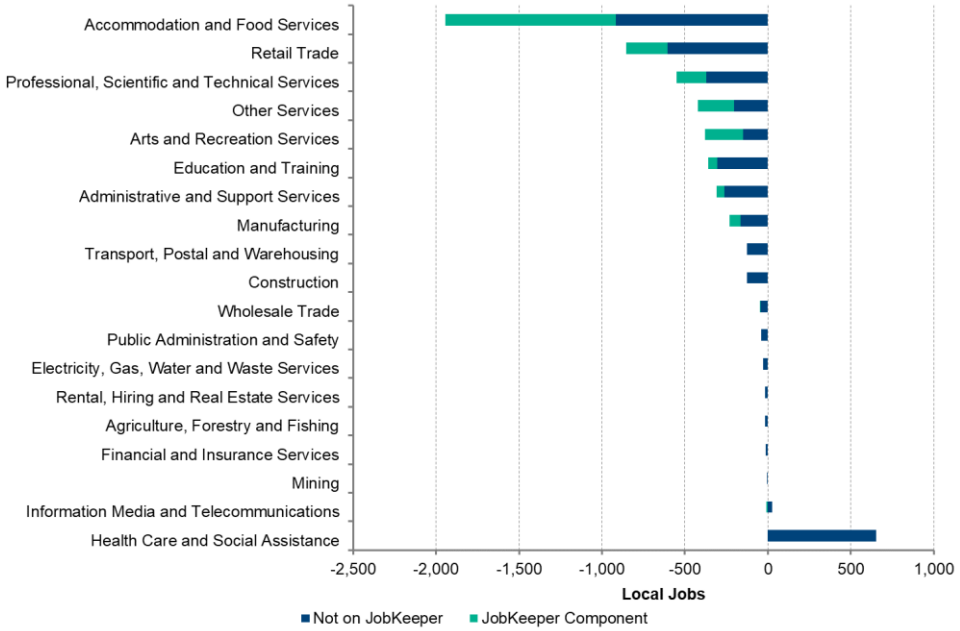

Figure 16 Local Jobs Impact in June 2020 quarter compared to 2018-19 quarter average, Tweed LGA[15]

[15] NIERIR (2019). Tweed Shire Council: COVID-19 Economics Outlook, economy id

3 LOCAL AREA LABOUR ASSESSMENT

Key Findings

- Kingscliff-Fingal Head SA2 is home to both the Tweed Sand Plant and over 15,100 residents.
- The area is home to a diverse labour force, which includes a higher proportion of residents working in the construction sector than both the Tweed and NSW labour forces.
- The Gold Coast features prominently as an employment destination for many Tweed and Kingscliff-based construction workers, with over 800 Tweed construction workers travelling to the Gold Coast – this accounts for 1 in every 5 construction workers living in the Tweed LGA.

3.1 Area Definition

The local area has been defined as the Kingscliff – Fingal Head SA2 area in which the current Hanson Tweed Sand Plant Is located as indicated in the figure below.

Figure 17 Local Area Map

3.2 Population

The Kingscliff – Fingal Head SA2 had an ERP of 15,149 persons in 2019. The area has experienced consistent strong growth over the last two decades, with its population nearly doubling, increasing at an average annual rate of 3.3%. In 2019, the population of Kingscliff – Fingal Head SA2 accounted for 15.6% of the wider Tweed LGA population.

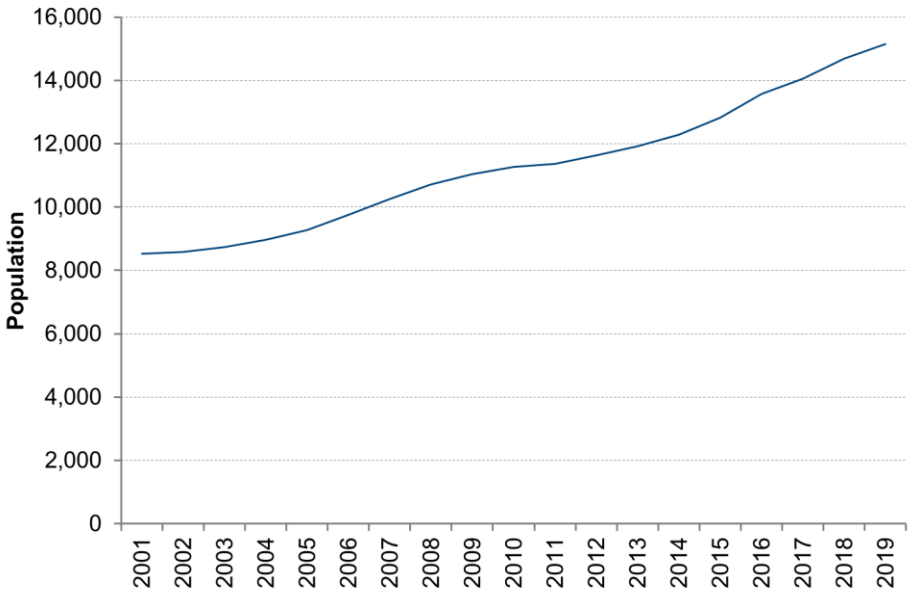

Figure 18 Historic Population, Kingscliff – Fingal Head SA2, 2001 - 2019[16]

3.3 Socio Economic Characteristics

The Kingscliff- Fingal Head SA2 scored 981 on the IRAD, indicating it is a somewhat disadvantaged region. Within the state it ranked 245 and 857 in Australia. Within that SA2 region the lowest ranking SA1 was 765 and the highest ranking SA1 was 1145; this indicates a range of advantage and disadvantage existing within Kingscliff – Fingal Head SA2. The SA2 appears to be less disadvantaged than the Tweed LGA, which scored 956 on the IRAD.

Table 2 IRSAD, Kingscliff - Fingal Head SA2, Tweed LGA[17]

Geography	IRSAD
Kingscliff – Fingal Head SA2	981
Tweed LGA	956

To determine the level of disadvantage in an are the Index of Relative Social Disadvantage (IRSD) is useful. A score below 1000 indicates a more disadvantage, and a score above 1000 indicates less disadvantage. Kingscliff-Fingal Head scores 983, indicating more disadvantage than less disadvantage. This score ranks it 240 for disadvantage in New South Wales and 774 in Australia.

Table 3 IRSD, Kingscliff - Fingal Head SA2, Tweed LGA

Geography	IRSD
Kingscliff – Fingal Head SA2	983
Tweed LGA	973

[16] ABS (2020). Population Estimates by SA2, Cat. No. 3218.0, Australian Bureau of Statistics

[17] ABS (2018). Socio-Economic Indexes for Areas (SEIFA), Cat. No. 2033.0.55.001, Australian Bureau of Statistics

3.4 Labour Force

3.4.1 Unemployment Rates

The unemployment rate for the Kingscliff – Fingal Head SA2 has historically followed the trend of the Tweed LGA but has remained lower structurally. At the peak unemployment rates in 2015, the largest difference between the two areas was 2.6%. The most recent indicator for the March 2020 quarter revealed the Kingscliff – Fingal Head SA2 had an unemployment rate of 2.2% compared to 3.8% in Tweed LGA. The participation rate of the Kingscliff – Fingal Head SA2 is slightly higher at 59.5% compared to the wider Tweed LGA rate of 54.8%.

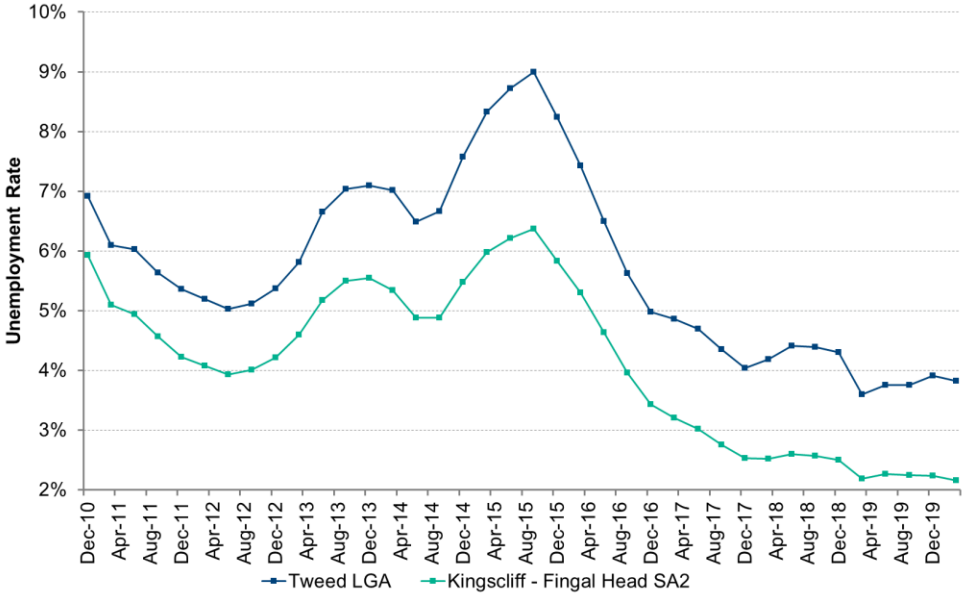

Figure 19 Unemployment Rate, Kingscliff-Fingal Head SA2 and Tweed Shire[18]

3.4.2 Employment by Industry

Construction employment – supported by construction materials such as sand – features more prominently in the Kingscliff – Fingal Heads SA2 than both the Tweed and NSW labour forces. In 2016, 12.5% of workers living in the area surrounding the Tweed Sand Plant were employed in construction, compared to 11.8% for the Tweed LGA as a whole and 8.8% for NSW.

[18] DESE (2020). Small Area Labour Markets – SA2, Department of Education, Skills and Employment

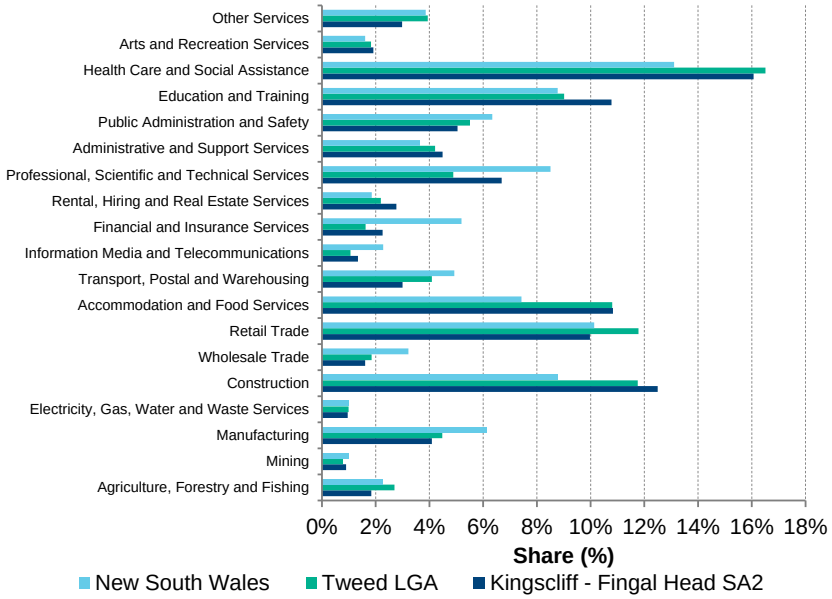

Figure 20 Employment by Industry, by Place of Residence, Kingscliff – Fingal Head SA2, Tweed LGA and NSW[19]

3.4.3 Construction Work-Related Travel

The proximity of the Tweed LGA to Queensland -and in particular, the Gold Coast LGA – means that the larger Gold Coast economy plays an important role for job opportunities for Kingscliff-Fingal Head SA2 workers.

In 2016, the Gold Coast supported 8,060 jobs for people whose usual place of residence is in the Tweed LGA. Approximately 806 (10%) of these jobs were in the Construction industry.

Conversely, of all usual residents of the Tweed LGA working in the Construction industry, 20% travel to the Gold Coast for work. That means 1 in every 5 construction workers living in the Tweed LGA travel to the Gold Coast for employment each day.

The Kingscliff-Fingal Head SA2 is a suburban area which necessitates some residents travelling to other urban or industrialised areas for work. In 2016, 3,283 employed persons (30.6%) from the Kingscliff – Fingal Heads SA2 worked in the Tweed LGA, while 1,255 employed persons (11.7%) worked in the Gold Coast LGA.[20]

House Construction, Non-Residential Building Construction and Electrical Services industries made up 27% of total Construction jobs of SA2 residents working in the Gold Coast and employed 207 people collectively[21].

Of the 1,255 persons travelling to the Gold Coast for work from the Kingscliff – Fingal Head SA2, the three biggest employing industries, the Health Care and Social Assistance industry employed 241 (19.2%), Education and Training employed 145 (11.6%), and Construction employed 124 (9.9%).

This means that a significant share of the local labour force is not only dependent on the flow of construction materials – such as sand from the Hanson Tweed Sand Plant – for their employment in the Tweed and NSW economies, but also for their employment in the Gold Coast.

[19] ABS (2016). 2016 Census of Population and Housing, Australian Bureau of Statistics

[20] ABS (2016). 2016 Census of Population and Housing, Australian Bureau of Statistics

[21] ABS (2016). 2016 Census of Population and Housing, Australian Bureau of Statistics

4 SAND MARKET PROFILE AND DEMAND

This section profiles fine sand resources and production within Northern NSW and the Gold Coast LGA. It also profiles major sources of demand and establishes projections of demand

Key Findings

- The Queensland market saw a significant rise in sand demand in 2019, reaching the highest level since 2008.
- There is only a small number of sand plants and resources to the south of Brisbane, with the Tweed Sand Plant currently playing an important role servicing both the Gold Coast and northern NSW markets.
- Demand for sand is expected to be supported by three factors:
    - Regional population growth;
    - Major infrastructure projects in South East Queensland and Northern NSW; and
    - Export demand into Queensland (namely South East Queensland).

4.1 Current Sand Resources

4.1.1 Northern NSW Resources

There are several major sand producers in the northern NSW region along with a number of smaller resources. Although, the NSW government does not have a data source that contains the aggregate state production of resources, production data has been identified for some larger producers.

This is shown in the table below. A list of smaller construction sand producers have also been identified in the list.

Table 4 Northern NSW Sand Resources[22]

Resource Name	Operator	Annual Production Rate
Dunloe Sands	Holcim	186,280 tonnes (2019)
South Ballina Sand Quarry	South Ballina Sands	54,146 tonnes (2019)
Champions Sand	Champions	250,000 tonnes* (2010)
Doonbah Quarry	C&J Uebergang	490,000 tonnes* (2020)
Buntings Quarry (Woodburn)	SEE	500,000 tonnes* (2020)
Newmans	Newmans	500,000 tonnes* (2020)
Kingscliff Sands	Kingscliff Sands	Less than 50,000 tonnes
Action Sands	Action Sands	Less than 50,000 tonnes
McGeary''s Sand	Holcim	Less than 50,000 tonnes
Ballina Sands	Ballina Sands	Less than 50,000 tonnes
McGeary's White Sand	RMS to purchase	Less than 50,000 tonnes
Holmes	Holmes Sand	Less than 50,000 tonnes
Kingsbrae	Kingsbrae	Less than 50,000 tonnes

* Approved to extract amount by NSW DPIE.

[22] Production rate data is sourced from individual operation and company reports as well as specific approvals data from NSW DPIE.

4.1.2 Gold Coast Resources

Queensland is an established export market for sand produced in the Tweed Sand Plant.

Queensland's natural sand production from extractive industry has experienced varied levels of supply over the last 20 years. Production peaked in 2008, with Queensland producing 6.6 million tonnes. Since then, production has steadily decreased to 4.7 million tonnes in 2018. Production has increased sharply to 6.2 million tonnes in 2019.

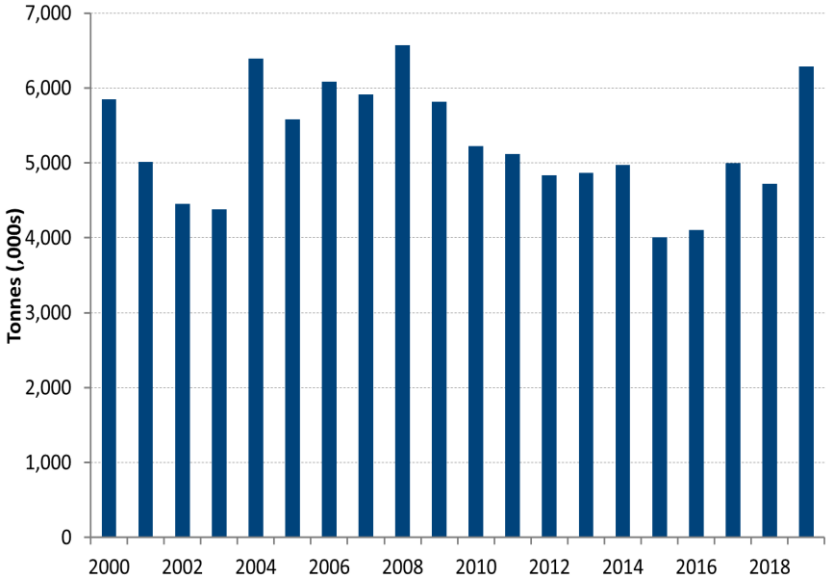

Figure 21 Natural Sand Production, Queensland[23]

Utilising the list of Major Plant Operations and Key Resource Areas (KRA) identified by the Queensland Department of Natural Resources, Mining and Energy (DNRME), the following sand plant operations producing greater than 80,000 tonnes on average, have been identified in the region :

Table 5 Sand Suppliers in Gold Coast LGA and surrounding area [24]

Plant Name (KRA)	Operator	LGA
Carbrook - Eagleby (KRA 63)	River Sands Pty Ltd	Logan and Gold Coast LGAs
Jacobs Well – Coastal Sands (KRA 65)	Coastal Sands	Gold Coast LGA
Jacobs Well – Wholesale Sands (KRA 65)	Wholesale Sands Pty Ltd	Gold Coast LGA
Marks Road (KRA 65)	Corridor Sands	Gold Coast LGA
Clutha Creek (KRA 94)	CCS Materials Pty Ltd	Logan City Council

Profiles of a selection of these suppliers is provided below.

4.1.3 Carbrook - Eagleby

The resource is located on the northern and southern banks of the Logan River south of the Beenleigh – Redland Bay Road at Carbrook. The processing area is sited with the original workings on the northern bank of the river. The resource of mainly fine to medium grained quartzose sand is within the alluvium of the Logan River. The sand is up to 10 metres thick beneath 3 to 4 metres of mainly loam and silty clay

[23] DNRME. (2019). *Sand & Gravel extractive industry production in Queensland.* Department of Natural Resources, Mines and Energy

[24] DNMRE. (2016). *Major Extractive Industry Operations Contact List.* Department of Natural Resources, Mines and Energy.

overburden. The material is dredged on the south side of the Logan River, and pumped to the processing plant through a pipeline buried in the bed of the river.

The resource is sufficient for several years to meet a large proportion of demand in the south Brisbane and Gold Coast markets, as well as export markets for specialist sand product.

4.1.4 Jacobs Well

The Jacobs Well sand resource is located on Beenleigh-Redland Bay Road within the Gold Coast LGA. The resource consists of fine grained rounded quartzose sand of marine origins. The resource has four deposits with two extractive industry permits. Historically the resource has produced sand for concrete production. It is the Gold Coast's largest onshore fine sand resource. Its sand is predominantly coarse enough for concrete or asphalt[25]. The resource is strategically located adjacent to the M1 in a fast-growing corridor of South East Queensland.

It is currently operated by Wholesale Sands & Recycling, which started with a small sand mining operation over 30 years ago. This quickly grew into a large-scale wholesale operation supplying sand, soil and loam products. As a result of the mining operations, a natural lake was formed. In 2010, the recycling business was established, accepting a wide variety of approved materials to back fill the lake following strict environmental guidelines.

4.1.5 Clutha Creek

The resource is located on the north side of Clutha Creek, about 3.5 kilometres north of Tamborine Village. It is an area of approximately 100 hectares, comprises colluvium and weathered sandstone. An existing operation based on ripping, washing and cyclone separation produces graded sand products. The resource is sufficient for 20 to 30 years of supply. The resource currently supplies a market area extending from the south side of Brisbane to the Gold Coast. It is one of a small number of sand supply sites south of Brisbane.

4.2 Sand Product Demand

Construction materials demand and supply are closely aligned. This reflects the fact that quarries generally do not produce materials for stockpiling and instead, only produce in response to market demand through contracts. This means that historical production levels are in fact an indicator of the level of demand for each product.

Similarly, there are a number of contributing factors to total demand:

- Regional population growth (accounting for demand generated by the growth of population in Tweed and Gold Coast LGAs)
- Major infrastructure projects in the Gold Coast and North NSW;
- Overall "export" demand originating from Queensland and servicing the wider SEQ.

4.2.1 Regional Population-based demand

From 2008 to 2018, the market demand for sand has fluctuated and the plant has averaged an annual extraction rate of 240,000 tonnes.[26] Utilising the historical extraction data and recent Tweed and Gold Coast LGA population estimates and projections, RPS can determine a population-based demand rate for sand in the Tweed region. Based on the above, RPS estimates that the demand for sand will increase from an average of 240,000 tonnes between 2008 and 2018 to over >300,000 tonnes by 2028 and over 392,000 tonnes by 2041.

This is recognised as a conservative-base estimate of demand in the Gold Coast and Tweed region's only.

[25] DNMRE (2016). *Key Resource Areas: reports and maps.* Department of Natural Resources, Mines and Energy.

[26] DPE NSW. (2018). Tweed Sand Plant Extraction Rate Increase – Environmental Assessment Report.

4.2.2 Major Infrastructure Pipeline

The Gold Coast region has a strong pipeline of major infrastructure works over the next five years. The pipeline is dominated by transport projects which has been a focus for the State Government in response to the rapidly growing population in the region.

Key funded projects include:

- Pacific Motorway M1 South Segments ($629m)
- Gold Coast Light Rail Stage 3A – Broadbeach to Burleigh ($500m)
- Gold Coast Runway Upgrades ($100m)

Key unfunded projects include:

- Varsity Lakes to Elanora Rail Extension ($470m)
- Gold Coast Desalination Plant Expansion ($300m)
- Jabiru Island Bridges Duplication – Stage 4 ($102m)

The Northern NSW infrastructure pipeline also includes the Tweed Valley Hospital expansion valued at $582m.

Given the pipeline of major infrastructure projects in the Gold Coast and Tweed regions, the level of demand for construction sand will inevitably increase as the projects move into the construction stage.

4.2.3 Exports to Queensland

A review of data from Hanson on production and sales from the Tweed Sand Plant confirms the principal role of the plant in supplying – or "exporting" sand to the Queensland market. In recent years, the share of product which has been exported has varied between 82% and 90%.

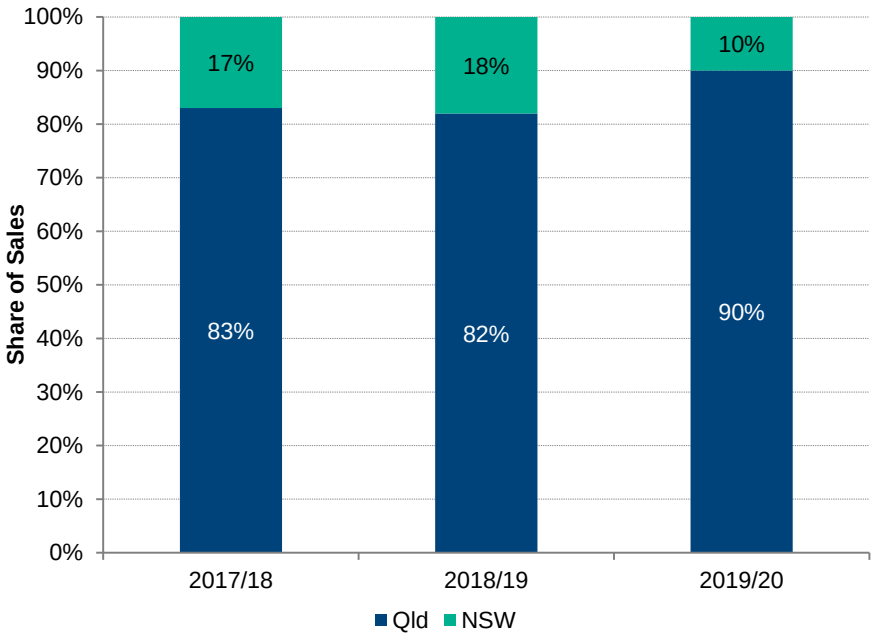

Figure 22 Place of Destination of Hanson Tweed Sand Plant Sales, 2017/18 to 2019/20

Previously, shares of product destined for local markets has reached as high as 20% (or more than 50,000 tonnes annually), reflecting the importance of sand production from the Tweed site in supporting regional construction activity.

4.3 Tweed Sand Plant Demand Projections

Based on the above factors (regional demand, major infrastructure demand and interstate exports, RPS has estimated that demand for sand at the Tweed Sand Plant will increase by an average of 25,000 tonnes per year over the assessment period, up to a maximum of 950,000 tonnes per year (based on the proposed maximum annual production cap).

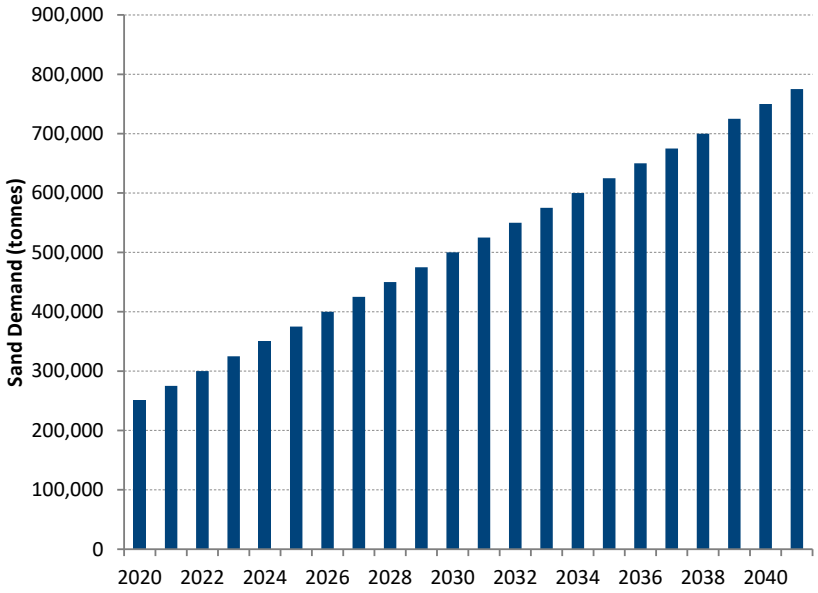

Figure 23 Annual Sand Demand, Hanson Tweed Sand Plant, 2020 to 2041

This demand profile is regarded as a trend scenario and does not factor in seasonal or cyclical peaks in demand.

4.3.1 Impact of Current and Proposed Production Caps

A review of current (500,000 tonnes per annum) extraction cap indicates that this cap will become a constraint to meeting demand (on a trend basis) by 2030. In contrast, increasing the extraction cap to 950,000 tonnes per annum will remove this constraint while also providing the plant with capacity to meeting peak demand spikes. This is illustrated below.

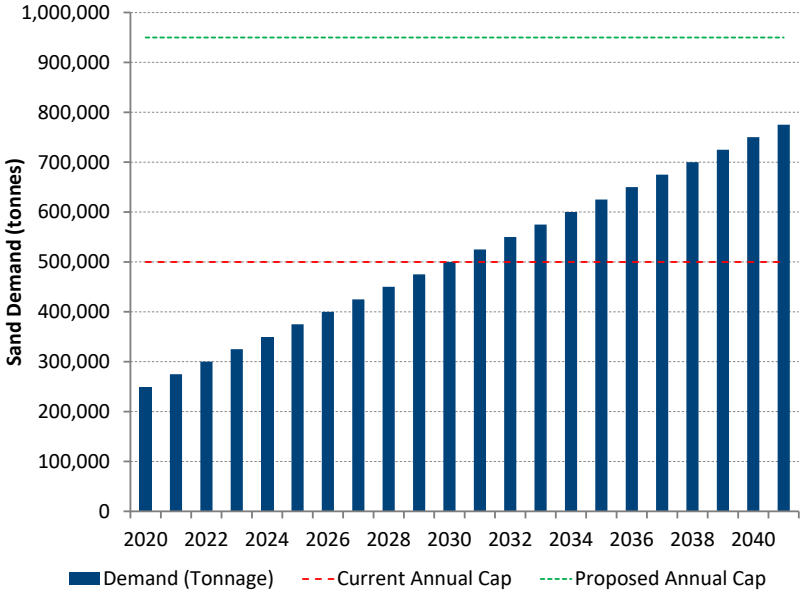

Figure 24 Annual Sand Demand and Hanson Tweed Sand Plant Production Caps (existing and proposed), 2020 to 2041

A review of this relationship however does highlight the potential risks of above trend growth or spikes in demand particularly between 2025 and 2030. This could result in demand exceeding supply, causing price and supply risks for local and regional construction sectors and infrastructure projects. This supports the need for the allowance for expanded sand production in the short-term, particularly given the lead times for securing access to the resource for major projects.

5 ECONOMIC IMPACT ASSESSMENT

This section summarises the employment indicators and economic impact assessment results for the Hanson Tweed Sand Plant Expansion. This section also provides an outline of the methodology and assumptions associated with the preparation of these results.

Key Findings:

- RPS has assessed the expenditure based economic impacts and contributions of the proposed expansion project using regionalised input-output economic multipliers.
- Adjustments have been made to address methodological concerns and criticisms through the use of a regionalised (NSW and Tweed) model and the presentation of Simple economic multipliers only.
- The results show that during the Construction/Establishment phase of the expansion, the project will generate $21.6m in output, $5.7m in Income, 43 jobs (direct and in first round supply chains) and $9.4m in Gross Value Added for NSW.
- Operational activity (post expansion at full production capacity) will generate $6.3m in economic output, $1.7m in incomes, 18 jobs (direct and in first round supply chains) and $3.0m in Gross Value Added annually for NSW.
- Tweed LGA will capture the lion's share of impacts on the NSW economy, accounting for 92.4% of Construction phase GVA and 89.9% of Operational Phase GVA.

5.1 Methodology and Approach

At the core of an Economic Impact Assessment is Input–Output (IO) tables. IO tables are part of the national accounts by the ABS and provide detailed information about the supply and use of products in the Australian economy, and the structure of and inter–relationships between Australian industries.

IO tables are converted, through statistical analysis, into a series of Economic Multipliers. These Multipliers represent the relationship between the direct activity (expenditure or production) associated with a Project and the wider economy.

The results of an EIA are generally presented as both direct effects, that is effects from the direct activity of the Project or event, and indirect effects, which are additional effects from further rounds of spending in the supply chain. A third or consumption effect, resulting from rounds of consumer spending generated by the additional income in the region can also be calculated.

There are two broad levels of Multipliers that can be utilised for Impact Assessments:

1. **Simple Multipliers** – including the Direct or Initial Effect, First Round and Industry Supply Chain effects;
2. **Total Multipliers** – including the Simple Multipliers plus subsequent Induced Production and Household Consumptions effects.

Impact Assessments can assess:

- **Output** - the actual dollar amount spent on the Project in the Region;
- **Income** - the amount of wages and salaries paid to labour;
- **Employment** - the full-time equivalent (FTE) per annum employment generated by the project; and
- **Value Added** - the value added to materials and labour expended on the project.

RPS has undertaken an Impact Assessment for the Tweed regional economy, focused solely on **Simple Multipliers**. For the Tweed regional economic impacts, this entailed the following tasks:

1. Transaction tables were developed from National IO tables for the Tweed economy. For the Tweed regional economy, the Regional Transaction Table was calculated by applying employment-based location quotients for the Region, based on the results of the 2016 Census of Population and Housing. This has the effect of excluding spending on imports to the Region since they generate no local economic activity.

2. Economic Multipliers were then generated for Tweed regional economy across 119 industry categories defined by the ABS;

3. Construction and operational expenditure and production associated with the development were allocated across 119 industry categories; and

4. Economic impacts associated with the Project are calculated.

5.1.1 Criticisms of Impact Assessments

Economic Impact Assessments based on IO-tables and Economic Multipliers have been criticised by Government and academia. RPS recognises Economic Multipliers are based on limited assumptions that can result in multipliers being a biased estimator of the benefits or costs of a project.

Shortcomings and limitations of Multipliers for economic impact analysis include:

- **Lack of supply–side constraints**: The most significant limitation of economic impact analysis using multipliers is the implicit assumption that the economy has no supply–side constraints. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or if it is near capacity.

- **Fixed prices**: Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. Prices are assumed to be unaffected by policy and any crowding out effects are not captured.

- **Fixed ratios for intermediate inputs and production**: Economic impact analysis using multipliers implicitly assumes that there is a fixed input structure in each industry and fixed ratios for production. As such, impact analysis using multipliers can be seen to describe average effects, not marginal effects. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount.

- **No allowance for purchasers' marginal responses to change**: Economic impact analysis using multipliers assumes that households consume goods and services in exact proportions to their initial budget shares. For example, the household budget share of some goods might increase as household income increases. This equally applies to industrial consumption of intermediate inputs and factors of production.

- **Absence of budget constraints**: Assessments of economic impacts using multipliers that consider consumption induced effects (type two multipliers) implicitly assume that household and government consumption is not subject to budget constraints.

- **Not applicable for small regions**: Multipliers that have been calculated from the national IO table are not appropriate for use in economic impact analysis of projects in small regions. For small regions multipliers tend to be smaller than national multipliers since their inter–industry linkages are normally relatively shallow. Inter–industry linkages tend to be shallow in small regions as they usually do not have the capacity to produce the wide range of goods used for inputs and consumption, instead importing a large proportion of these goods from other regions.

5.1.2 Adjustments to Improve EIA Reliability

Despite this, IO tables and Economic Multipliers remain popular due to their ease of use and communication of results. RPS has undertaken a number of steps and made appropriate adjustments to the EIA methodology to address and mitigate these concerns.

RPS has only used Simple Multipliers in the Assessment. This has the effect of discounting Household Consumption impacts from the assessment. By doing so, only those industries with a first round or supply chain connection are considered. This has the effect of making the results of the EIA conservative and suitable to inform decision making.

RPS regards the use of Economic Multipliers as part of this Assessment as appropriate and reliable. The results of the assessment are conservative, defensible and suitable for informing decision making.

5.2 Summary of Results

The following tables provide a breakdown of the direct and indirect economic impacts of the Hanson Tweed Sand Plant Expansion during construction and operational phases.

5.2.1 Construction

To calculate construction impacts, RPS first established the net domestic construction spend based on data provided by Hanson, with an overall capital cost of $12m. RPS attributed $7m (58.3%) of the capital expenditure to the Heavy and Civil Engineering sector (covering the construction process from civil earth works to infrastructure and installation), and $5m (41.7%) to the Specialised and other Machinery and Equipment manufacturing.

Direct and indirect economic impacts of construction of the proposed Project to the NSW and Tweed LGA economies are summarised in the tables below.

Table 6 Construction Impacts, NSW and Tweed LGA economies

NSW	Initial Impact	First Round Impact	Total Impact
Output ($m)	$12.0	$5.4	$21.6
Income ($m)	$3.1	$1.5	$5.7
Jobs (FTEs)	19	14	43
Gross Value Added ($m)	$5.1	$2.4	$9.4

Tweed LGA	Initial Impact	First Round Impact	Total Impact
Output ($m)	$12.0	$5.0	$20.1
Income ($m)	$3.1	$1.4	$5.3
Jobs (FTEs)	19	13	40
Gross Value Added ($m)	$5.1	$2.2	$8.7

A total of 43 jobs were estimated to be generated by the Project (***both directly and in first round supply chains***) from construction. Given the nature of the Project and the anticipated timeframe of construction completion, a majority of job creation will be realised in the first year during the construction period. Approximately $5.7m of income is expected to stem from the Project in NSW, with overall GVA projected to reach $9.4m. The Tweed LGA is expected to capture the lion's share of Construction Phase impacts with 93% of income, 93.1% of jobs and 92.4% of Gross Value Added in NSW.

This construction employment will be spread across the construction phase, including initial road and infrastructure works and subsequent plant relocation and expansion.

5.2.2 Operational Activity

To establish operational impacts, RPS drew on data provided by Hanson on the expected operation costs for the Project and attributed each category of expenditure to the relevant ABS industry. Category allocation can be found below in Table 2.

Table 7 Annual operational costs per ABS industry allocation

Cost Category	Value	Allocated ABS Industry
Operations and maintenance	$1.55m	Electricity Generation Water Supply, Sewerage and Drainage Services Finance Insurance and Superannuation Funds Professional, Scientific and Technical Services Other Repair and Maintenance Other Services
Transport	$2. 25m	Road Transport Transport Support services and storage

The direct and indirect economic impacts of the Project to the NSW and Tweed regional economies once operational are summarised in the table below.

Table 8 Operational Impacts, NSW and Tweed LGA economies

NSW	Initial Impact	First Round Impact	Total Impact
Output ($m)	$3.8	$1.5	$6.3
Income ($m)	$1.0	$0.4	$1.7
Jobs (FTEs)	12	4	18
Gross Value Added ($m)	$1.7	$0.8	$3.0

Tweed LGA	Initial	First	Simple
Output ($m)	$3.8	$1.3	$5.7
Income ($m)	$1.0	$0.4	$1.5
Jobs (FTEs)	12	4	17
Gross Value Added ($m)	$1.7	$0.6	$2.7

Based on RPS' analysis, the proposed Project will stimulate an annual total of $6.3m in simple terms, reflected by an additional generation of $1.7m in Income in NSW, 18 FTE jobs (direct and indirect first round supply chains) and $3.0m in Gross Value Add per year. Approximately $1.7m of GVA will be realised as a result of initial impacts, while and extra $0.8m will be felt through first round effects.

Once again, the vast majority of the Operational phase impacts will be captured by the Tweed LGA each year including:

- 91.6% of NSW Incomes
- 94.5% of NSW jobs; and
- 89.9% of NSW GVA.

6 COST BENEFIT ASSESSMENT

This section provides a summary of the cost benefit assessment of the Tweed Sand Plant including relevant discount rates, and triple bottom line costs and benefits.

Key Findings

- RPS has undertaken a cost benefit assessment of the Tweed Sand Plant expansion in line with TPP17-03 NSW Guide to Cost Benefit Analysis.
- A cost of capital approach has been adopted (i.e. excluding operational costs except expansion linked maintenance) and revenues have been excluded through the use of Gross Value Added estimates on all economic benefits.
- Consideration has been given to the indirect cost of the loss of agricultural output on the subject site.
- Additionally, a range of benefits have been assessed including:
    - Construction/Establishment Phase Supply Chains
    - Export Values (Gross Value Added)
    - Share of the GVA of Construction Activity Supported in NSW by the Resource.
    - Residual Resource Value (Gross Value Added)
- The results of the assessment indirect a net present value ranging from $24.0m over 20 years at 10% to $91.3m at 3%.
- Similarly, the benefit cost ratios of the expansion exceeds 2.0 under all scenarios – ranging from 2.9 under 10% to 6.3 under 3%.
- A sensitivity test increasing the NSW share of sand plant production from 5% to 20% (i.e. reducing export shares to 80%), resulted in a marginal increase in BCRs across all discount rates, confirming that the economic contributions of the sand produced at the plant are similar whether it is used as a local construction material input or exported.
- This reflects the increasingly integrated nature of the Tweed economy with that of the Gold Coast – an integration which is identified as a critical opportunity for the region in the Tweed Regional Plan.

6.1 Cost Benefit Assessment Methodology

This section summarises the Cost Benefit Analysis (CBA) methodology and assumptions.

6.1.1 Methodology

A CBA is the most commonly used, and most comprehensive, of the economic evaluation techniques. Essentially, a CBA compares the monetised benefits and costs of a project to evaluate the desirability of a project. A CBA provides little value if it is conducted without a base case in which with to compare options. For this study, the development option is therefore analysed based on only the incremental, or additional, benefits and costs with respect to a base case. This approach is the most appropriate to assess the net economic benefits that accrue from the two development options.

The CBA steps include:

1. Identify the quantifiable benefits that can be monetised;

2. Calculate the value (in monetary terms) of the quantified incremental benefits and capital costs in net present value (NPV) terms using the discount rates;

3. Calculate the benefit cost ratio (BCR) – the total present value of all net benefits compared to the present value of capital costs to determine the ratio to which incremental net benefits exceed (or undershoot) incremental costs related with the upgrade; and

4. Undertake a sensitivity assessment.

6.1.2 Discount Rates

Discounting is the reverse of adding (or compounding) interest. It reduces the monetary value of future costs and benefits back to a common time dimension – the base date. Discounting satisfies the view that people prefer immediate benefits over future benefits (social time preference) and it also enables the opportunity cost to be reflected (opportunity cost of capital). Recognising the potential for multiple audiences for the results, real discount rates of 3, 7 and 10% have been applied.

This is broadly aligned with the guidelines of 3, 7 and 10% initially set by the Office of Best Practice Regulation (OBPR) in 2014[27]. The Grattan Institute's 'Unfreezing discount rates' report recommended a discount rate of 3.5% for infrastructure projects bearing low-risk, and 5% for high-risk projects, while the HRSC ITC's 'Building Up & Moving Out' suggested a discount rate of 4% given the historically low level of interest rates. Alternatively, a report by Abelson & Dalton (2018) from Applied Economics suggested an appropriate social discount rate of 6.5%[28]. Considering the varying suggestions, RPS considers assessment at multiple discount rates to be necessary in establishing project feasibility.

For the purpose of this assessment, RPS has complied with discount rates as established in TPP17-03 NSW Guide to Cost Benefit Analysis – 3%, 7% and 10%[29]

Modelling of quantifiable benefits and costs are developed over a 20-year timeframe (post construction phase).

6.1.3 Financial Cost Approach

The cost benefit assessment undertaken in this report represents a "financial cost" assessment. This approach focuses primarily on the up-front capital costs and ongoing financial costs linked direct to the capital (i.e. assets maintenance costs).

Ongoing operational costs have been expressly excluded from the assessment, while all direct and indirect economic benefits have been calculated based on the Gross Value Added of the activities, rather than total output.

The effect of this approach is to help demonstrate the appropriateness of the investment decision and approvals as well as eliminate the impact of ongoing costs and revenues distorting the decision making process.

[27] Office of Best Practice Regulation (2020). Cost-benefit analysis guidance note, Department of the Prime Minister and Cabinet

[28] Abelson, P & Dalton, T (2018). Choosing the Social Discount Rate for Australia, Applied Economics

[29] NSW Treasury (2017) TPP17-03 NSW Guide to Cost Benefit Analysis accessed at https://www.treasury.nsw.gov.au/sites/default/files/2017-03/TPP17-03%20NSW%20Government%20Guide%20to%20Cost-Benefit%20Analysis%20-%20pdf_0.pdf

6.1.4 Assumptions

A series of assumptions as inputs into the cost benefit analysis have been made, from academic and industry literature. The following reference table is provided for the purposes of transparency.

Table 9 Cost Benefit Analysis Assumptions

Assumption	Value
Assessment period	20 years
Total capital cost	$12m
Ongoing Maintenance Costs	2.5% of capital costs per year
Current approved area production life	10 years (moderate demand profile)
Resource lifespan	30 years (10 years post assessment period)
Residual Resource/Land in 2041	50%
Sand demand profile	Refer to section 4.3.1
Land consumption rate	Refer to section 4.3.2

Other specific assumptions are outlined in Table 9 and Table 10.

6.2 Costs

Three financial costs have been included in this assessment:

- Capital costs;
- Ongoing maintenance costs; and
- Loss of Agricultural Production.

These costs and their methods of calculations are summarised in the following table.

Table 10 Profile of Costs of the Tweed Sand Plant Project

Indicator	Description	Calculation Method
Plant and Equipment Capital Costs	Allowance of $12 million for capital costs incurred during the expansion of the sand plant including: • Internal access road, including merging lane onto Tweed Valley Road offramp • Relocation and upgrade of processing plant • Replacement dredge and associated electrical upgrade.	Road and associated infrastructure is expected to be completed within the first year of the assessment. The relocation and upgrade of the plant and replacement of the dredge is assumed to occur in Year 9 (noting it could be as late as year 13).
Plant and Equipment Maintenance Costs	Allowance for annual cost of maintaining the proposed plant and equipment capital.	Estimated at 2.5% of the capital cost allowance, incurred each year after the first year across the assessment period.
Lost Agricultural/Pastoral Production	It is understood that current land (outside of the existing 46ha parcel) is utilised for low grade agricultural and pastoral activities. The expansion of the sand plant and progressive extraction of the resources over time will result in this production being reduced in scope and scale. This represents a non-financial indirect economic cost of the project.	Annual production value based on the median sale value of low grade agricultural/pastoral land in southern Queensland ($5,413 per ha[30]) in 2019. Calculated cumulatively and progressively from 2021/22.

[30] Rural Bank (2020), Australia Farmland Values (Southern Queensland), accessed at https://www.ruralbank.com.au/knowledge-and-insights/publications/farmland-values/

6.2.1 Summary of Costs

Overall, the present value of Project costs ranges from $17.3m under a 3% discount rate to $12.4m under the 10% discount rate. These values and the value of each individual cost items are illustrated below.

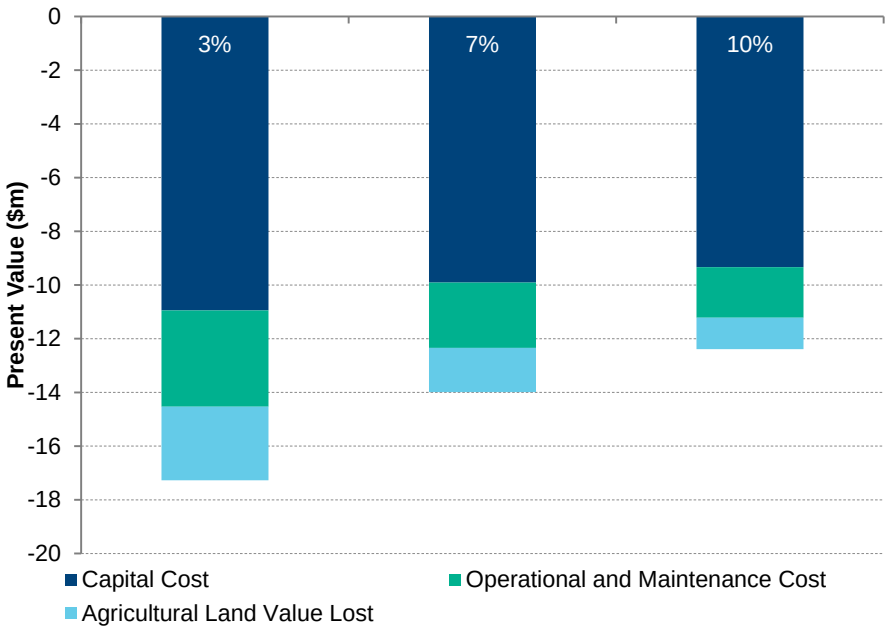

Figure 25 Present Value, Costs, Tweed Sand Plant Expansion, 2020 to 2041

6.3 Benefits

6.3.1 Identified Benefits

A range of direct financial, economic, social and environmental benefits of the Project have been identified. Those benefits which are capable of being monetised for inclusion in the CBA are outlined in the table below.

Table 11 Profile of Benefits of the Tweed Sand Plant Project

Indicator	Description	Calculation Method
Construction/Establishment Phase Supply Chains	Proportion of the Gross Value added of the value of the Plant and Equipment capital costs incurred by the project and captured by the NSW economy supply chains.	Direct GVA to Output ratio of 0.28 for NSW derived from ABS Input-Output national transaction tables and adjusted to NSW[31].
Export Values (Gross Value Added)	Leveraging economic opportunities for the Tweed into the Gold Coast and South East Queensland economies is a stated objective of the Tweed Regional Plan[32]. Gross Value Added of value of production "exported" from the NSW economy to Queensland. Accounts for 95% of production[33].	GVA proportion (28%) of economic value of resources produced each year over the assessment period (capped at total annual capacity). Values are net of transport costs. Applies from end of current resource life and/or above current annual production capacity.

[31] ABS (2020) National Accounts Input and Output Tables Cat No 5209.0.55.001 Accessed at https://www.abs.gov.au/statistics/economy/national-accounts/australian-national-accounts-input-output-tables/latest-release and derived by RPS

[32] NSW DPIE (2020) Tweed Regional Plan accessed at https://www.planning.nsw.gov.au/Plans-for-your-area/Regional-Plans/North-Coast/North-Coast-Regional-Plan/Local-government-narratives-and-urban-growth-area-maps

[33] Based on a review of 2017/18 to 2019//20 distribution profile for Hanson Tweed Sand Plant and advice from the client.

Indicator	Description	Calculation Method
Share of the GVA of Construction Activity Supported in NSW by the Resource.	Sand represents a critical construction material for use in residential and infrastructure projects. The share of production from the Sand Plant that is expected to remain in NSW will contribute to construction activity in the State (particularly northern NSW). Represents the downstream value of the resource.	Based on average sand input to an average house (costed at $175,000)[34]. Output value adjusted to GVA by NSW ratio. Attribution of 1% of the value to the resource inputs.
Residual Resource Value (Gross Value Added)	The remaining economic (GVA) value of the resource post the assessment period. Assumes a 30 year resource life (dependent on market demand).	Value based on expected remaining resource available in 2041, drawn down in line with projected demand growth. Output per hectare of land based on current production rates and applied to remaining resource stock and land area post 2041. Economic (GVA) value only.

6.3.2 Value of Benefits

Overall, the Project will yield benefits between $108.5m under a 3% discount rate to $36.4m at a 10% discount rate.

Table 12 Present Value of Benefit Categories ($ million), by Discount Rate, 2021 - 2041, Tweed Sand Plant

Benefits	3%	7%	10%
Establishment Phase Supply Chains	$6.6	$5.3	$4.7
Export Values	$29.6	$17.3	$11.8
GVA of Construction Activity Support in NSW	$3.2	$1.9	$1.3
Residual Resource Value (Gross Value Added)	$69.2	$32.3	$18.6
Total Benefits	$108.5	$56.8	$36.4

The largest contributor to these benefits is Residual Resource Value, accounting for $32.3m of the present value of benefits at 7% discount rate. The export values also contributes a significant share of benefits valued at $17.3m at 7% discount rate. Establishment Phase Supply Chains benefits contribute $5.3m while GVA of Construction Activity Support in NSW contributes $1.9m at 7% discount rate.

[34] Derived from ABS (2020) Building Approvals Australia Cat No 8731.0, Australia Bureau of Statistics, Canberra, for the Tweed LGA.

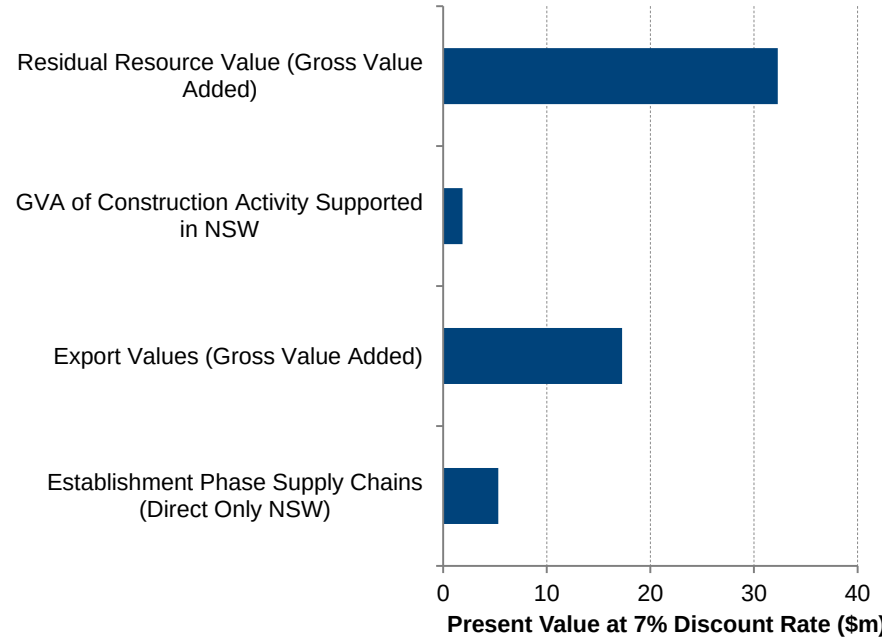

Figure 26 Present Value of Identified Benefits at 7% Discount Rate

6.4 Summary of Cost Benefit Analysis Results

Based on a comparison of the present values of the costs and calculated benefits, it is estimated that the Project will have a positive Net Present Value under all discount rates, ranging from +$24.0m at the 10% discount rate to +$91.3m at the 3% discount rate over the 20 year assessment period.

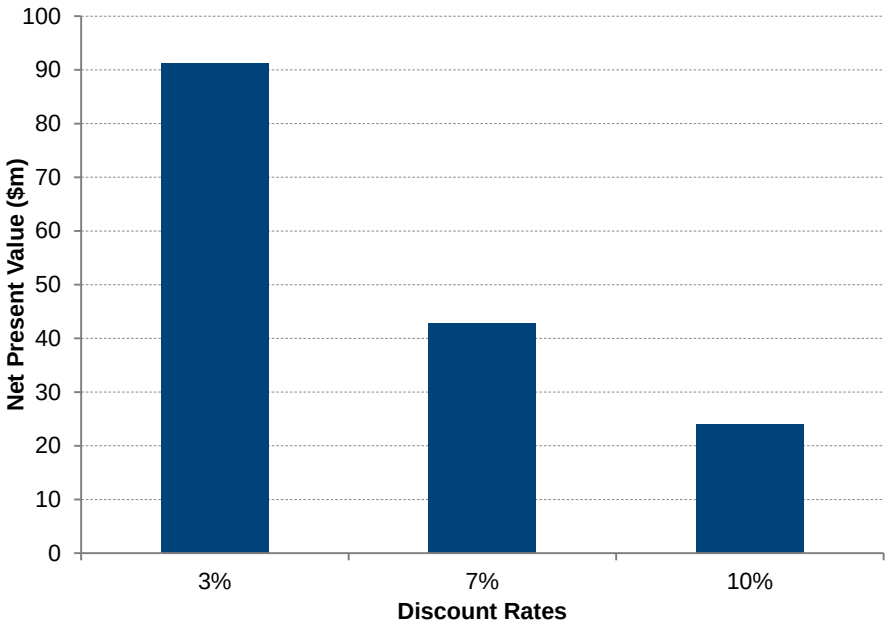

Figure 27 Net Present Values, by Discount Rate, Tweed Sand Plant

Similarly, a review of the Benefit Cost Ratios reveals ratios ranging from 6.3 at 3% discount rate to 2.9 at 10% discount rate. Results above 2.0 are regarded as positive.

The table below summarises the key outputs from the Cost Benefit Analysis.

Table 13 CBA Results, by Discount Rate, 2021 to 2041, Tweed Sand Plant

Indicators	3%	7%	10%
Costs	-$17.3	-$14.0	-$12.4
Benefits	$108.5	$56.8	$36.4
NPV	$91.3	$42.8	$24.0
BCR	**6.3**	**4.1**	**2.9**

These BCRs are also illustrated in the figure below.

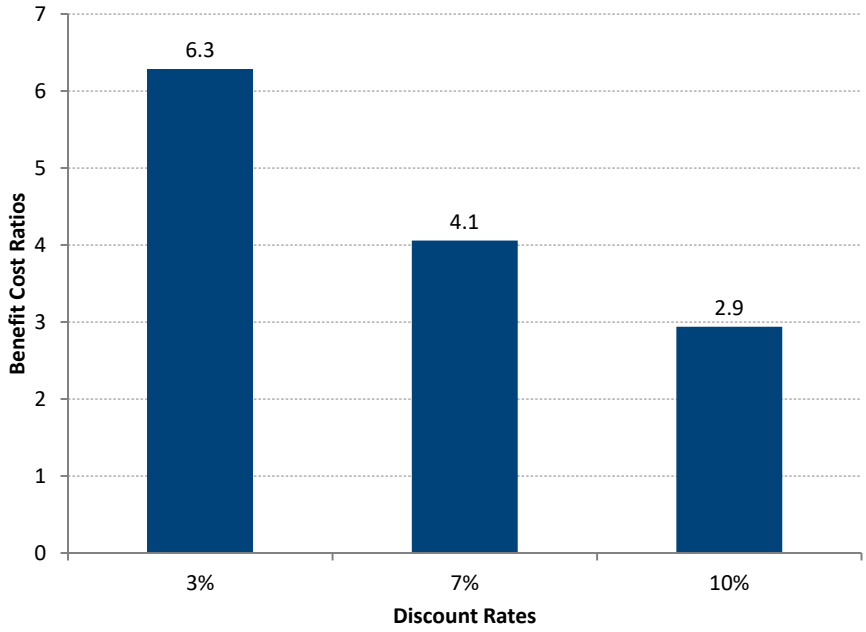

Figure 28 Benefit Cost Ratios, by Discount Rate, Tweed Sand Plant Expansion, 2020 to 2041

6.5 Sensitivity Test

In addition to the core scenario modelled in this section, RPS has also undertaken a sensitivity test for the Cost Benefit Analysis. The sensitivity test models the impact on the Benefit Cost Ratios if a greater share of sand production is directed to the NSW economy than currently projected.

While 95% of the sand produced by the expanded Plant is expected to be exported to Queensland, the growth of the northern NSW economy (including residential and major infrastructure projects) may result in an increased share of the product remaining in the State.

Assuming the NSW share is increased to 20% (with the remaining 80% exported), the Benefit Cost Ratios of the project increase marginally to 6.6 at the 3% discount rate and 3.1 at the 10% discount rate. This is illustrated below.

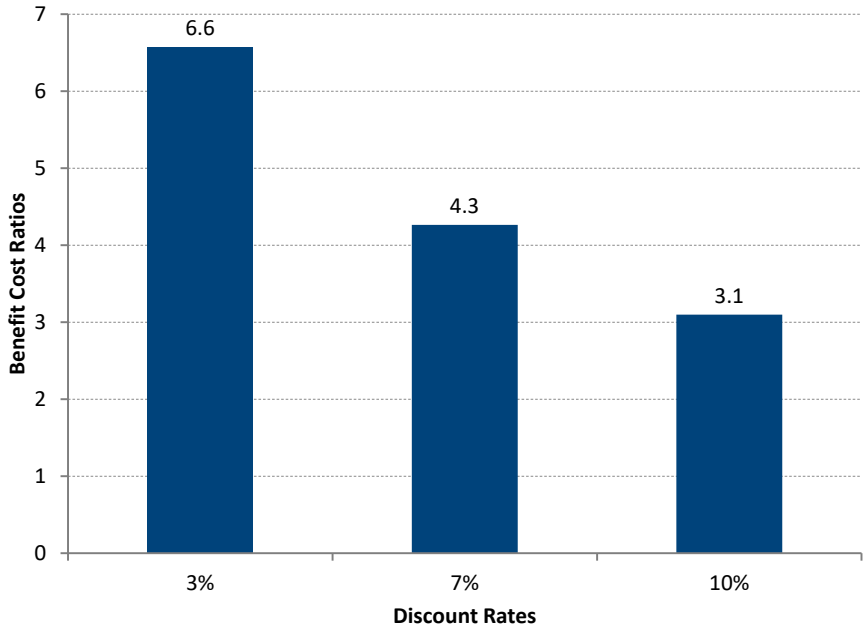

Figure 29 Benefit Cost Ratios, by Discount Rate, Tweed Sand Plant Expansion, 20% of Product to NSW, 2020 to 2041

The increase in the distribution of sand to NSW only has a marginal impact as the contribution to the Tweed and NSW economies of the sand as either an export or a direct input to construction activity is very similar (though slightly higher for construction).

Given that the Tweed economy is increasingly integrated with SEQ, exports of sand from Hanson Tweed Sand Plant to Queensland are expected to continue to have a direct benefit to the Tweed economy, industry and workforce, despite the resource leaving the state.

7 CONCLUSIONS

7.1 Summary of Conclusions

The expansion of the Tweed Sand Plant represents a significant opportunity for the Tweed and NSW economy to leverage local, regional and interstate population, development and infrastructure investment and growth to increase exports while ensuring the security of supply of critical local construction materials for the Tweed LGA.

The expansion of the Plant and the establishment of an increased extraction cap will address short-term resource availability issues expected to emerge later this decade, while also providing local employment, establishment and operational phase supply chain benefits for local businesses and indirectly support the region's construction workforce.

The project is expected to generate a positive benefit cost ratio across all discount rates and produce a positive net present value contribution to the Tweed and NSW economies.

7.2 End Uses

The resources available on the subject site will continue to be available for extraction post the assessment period of this economic evaluation. However, at a future point, the resource will become exhausted and the Tweed Sand Plant will cease to function.

The current commitment of Hanson is for the full environmental rehabilitation of the site and its retention for use for a potential range of commercial and/or recreational activities. The nature and viability of these potential end uses will be examined in further detail closer to the end date of the extraction operations and may be subject to additional planning approvals to support further employment generating economic opportunities on the site.