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Rev	Originator	Approved	Date
0	Ian Rigby / Michael Clyde	Brett Kalisch	20/09/2016
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F:\BNE\NATURAL RESOURCES\QCA - QLD COMPETITION AUTHORITY\BR23127 QCA DBCT SITE REHABILITATION\09 DELIVERABLES\ADDENDA\160909.QCA DCBT SITE REHABILITATION REPORT.ADDENDA 1.REVDRAFT.DOCX			

## 1 Executive Summary

Queensland Competition Authority (QCA) is currently assessing Dalrymple Bay Coal Terminal (DBCT) Management's revenue and pricing proposal included as part of the 2015 Draft Access Undertaking (DAU).

Turner & Townsend issued on behalf of QCA on 28 January 2016 a review of the proposed DBCT site rehabilitation costs for DBCT Management's 2015 DAU. This involved a desktop analysis to assess DBCT Management's submission, supporting material and stakeholder comment as well as advising on whether the projected costs are appropriate. A key assumption was that following decommissioning and demolition works the site would be returned to an open land use and revegetated accordingly. The output of the analysis also included an independent estimate of the rehabilitation estimate to a higher class than had previously been undertaken. The report is attached to this addenda.

In response to our report, DBCT Management disagreed with the interpretation of the remediation obligations under the Port Services Agreement (PSA). DBCT Management said Clause 22.4(b) does not reduce the standard to which DBCTM must rehabilitate the premises. Therefore, DBCTM said it is obligated to remediate the site to the standard as written—that is, to the site's natural state and condition. DBCT Management further advised that it anticipates the estimate for rehabilitation costs would increase by 10–20% to account for its interpretation of the PSA.

Turner & Townsend has been engaged by QCA to develop an alternative estimate of DBCT site rehabilitation costs to provide assessment based on DBCTM's alternative interpretation.

The variance between the Turner & Townsend January 2016 'Baseline Estimate' and September 2016 'Alternative estimate' is detailed in Table 1 below:

Ref	Area	January 2016 Baseline Estimate	September 2016 Alternative Estimate	Variance
A	Rail Loop & Receiving	17.74	18.33	3%
B	Inloading	9.43	9.10	-4%
C	Stockyard	34.38	66.37	93%
D	Outloading	236.82	230.82	-3%
E	Infrastructure/Other Civil Works	20.9	23.03	10%
F	Site Generally	4.19	6.50	55%
G	Final Site Rehabilitation	66.22	78.54	19%
<b>Total</b>		<b>389.69</b>	<b>432.69</b>	<b>11%</b>

Table 1 Variance between Baseline and Alternative Estimate

## 1.1 Key Cost Variances

The key cost variances between the Baseline Estimate and the Alternative estimate are driven by the following scope items:

- The Rail Loop Corridor, additional materials and re-grading
- The Rail Reveal Pits, additional fill materials
- The Rail Loop Dam, additional materials and site profiling
- Whole of Stockyard, general increase in remediation area and profile blending
- The Stockyard Foreshore, increase in excavation works and additional fill
- The Quarry Dam, additional profiling of surrounds and additional fill
- The Industrial Dam, additional profiling of surrounds and additional fill
- Outloading Foreshore, further excavations and additional site profiling
- Surge Bin area, further excavations, additional fill and profiling
- Whole of Site, increase in fill materials and greater levels of site profiling.

It is noted negative movements were attracted to the outloading and inloading areas, this is due to these areas receiving a lower relative distribution of indirect costs as their direct costs only increased marginally in the Alternative Estimate.

## 1.2 Alternative Independent Estimate – high level assumptions

Independent estimate assumptions are:

- Q42015 base date including owners costs and contingency
- Excludes
  - Revenue from resale of the land
  - Staff redundancy costs
  - Salvage costs
  - Allowances for changes in current legislation.

## 1.3 Conclusion

Whilst we believe the basis of our Baseline Estimate remains valid, if one was to adopt the DBCTM's alternative view, then it is estimated that the rehabilitation costs would increase by an order of magnitude of 11%.

This assessment has been made in the absence of a rehabilitation and future use masterplan on which to frame the cost estimate and to provide the definition to further increase the class of estimate.

## 2 Design assumptions of Alternative Estimate compared to Baseline Estimate

To provide continuity from Baseline Estimate, Turner & Townsend has further engaged Environmental Resources Management Australia (ERM) Ltd to review the previous scope assumptions in the context to cost the Alternative option for rehabilitation to “prior conditions”. In this regard we have considered what is reasonable to meet this qualitative specification and have identified what additional scope measures will be required.

### 2.1 Baseline Estimate Assumptions

The ‘Baseline Estimate’ required several assumptions on which to develop the rehabilitation cost estimate. A key assumption was that following decommissioning and demolition works the site would be returned to an open land use and revegetated accordingly.

This scenario is justified based on existing photographs contained within an early site investigation report prepared by Coffey Pty Ltd in 1980.

These photographs also assist with interpreting the vegetation cover, land form and use prior to establishing the DBCT.

The photographs show a vegetative cover comprising large areas of open grass with scattered trees. This condition formed the basis for the likely end use and vegetated condition.

The assumptions for landform were a hybrid of three likely closure models. The financial implications of each option vary according to effort. The closure options for the site include:

- Mothball option – shut down and secure asset to remain in place for 20 years, with future potential to become operational again;
- Partial demolition and decommissioning to ground level – demolition of asset and remove to ground level leaving sub terrain parts of asset (e.g. foundations) intact; and
- Full site clearance and rehabilitation – restore site to original condition

It was anticipated that a Hybrid of options 2 and 3 would be the most likely closure scenario. This assumption was arrived at for the following reasons:

- Hatch indicated that Clause 22.3 of the Port Services Agreement (PSA) requires a Rehabilitation Plan to be submitted to DBCT Holdings for review and approval.
- Given the proximity of the site to the beach and bay, the rehabilitation plan, would be required to be submitted for regulatory approval.
- Regulatory requirements will require the rehabilitation plan to demonstrate that upon relinquishment the site will be safe, stable and non-polluting.

For the above reasons, it was considered that the regulatory requirements for landform design and site contouring are such that they may preclude the site from being returned to its condition prior to development.

As such the Hybrid Option allowed for full demolition of above ground infrastructure and assets and partial demolition and removal of in ground infrastructure such as footing and foundations. This description formed the basis for "Reasonable rehabilitation efforts" and the associated cost estimate.

This assumption was made in the absence of a rehabilitation masterplan and proposed future use on which to frame the cost estimate.

## 2.2 Alternative Estimate Assumptions

In response to DBCT Management's concerns described earlier and in light of the regulatory constraints described, ERM has prepared an alternative scope description of the rehabilitation scenario being interpreted to a higher standard than open land use.

Again this description is in absence of an agreed and detailed Rehabilitation and Closure Plan. The assumptions applied profiling of the site such that it visually integrates the site into the adjoining boundaries and broader visual catchment. The final landform would be contoured to establish an organic final landform such to reflect the site topography prior to development of the DBCT albeit one that is safe, stable and non-polluting. This closure scenario is compliant with the rehabilitation requirements of the PSA and the Legislative rehabilitation obligations relevant at the time of undertaking this report.

Ecological and Vegetation Communities would also be re-established such that they would reflect those that also existed prior to the establishment of the DBCT similar to that demonstrated by the historical photos included in the 1980 Coffey Reports.

The scope has allowed for demolition of above ground works, bulk earthworks, top soil placement and rehabilitation. All activities which would be ordinarily included in restoring the site to original contours and condition. In the absence of an approved final rehabilitation plan the cost provisions within the Alternative Estimate are within the limitations provided in the review.

In light of the above it is not unreasonable to assume that adequate provision has been made for earthworks and revegetation works that are likely to be required under interpretation of the rehabilitation agreement. For accurate costings to be developed, a detailed and approved site rehabilitation plan should be prepared.

### 3 Basis of Estimate – by exception from Baseline Estimate

On the basis that we have applied the same estimating methodology from the Baseline Estimate to the Alternative Estimate, we have detailed our Basis of Estimate by exception.

Turner & Townsend's Scope of Work assumptions for our alternate estimate are further defined by the following details.

The Baseline Estimate was developed as an independent first principles estimate for the rehabilitation of the DBCT site. This estimate was based on returning the site to a safe and stable condition and of open land use. The estimate was generally formulated on the requirements of the Port Services Agreement.

After reviewing this estimate, Dalrymple Bay Coal Terminal Management have advised that their preference is for the estimate to be based on complete remediation of the site to its natural state and condition prior to development.

#### 3.1 Alternate Estimate Scope

The alternate scope of work for estimating purposes was developed by further review of the originally issued drawings and various site photos. Further drawings such as original site layouts and topographical drawings were requested and subsequently received for review purposes. This combined information enabled Turner & Townsend to define the scope requirements in accordance with DBCTM's interpretation of returning the site to its natural condition.

However, when considering the intent and meaning of the "site's original and natural condition prior to development" it is assumed that prior to development actually means prior to the development of the Dalrymple Bay Coal Terminal. It would be prudent to assume that the development of the preceding Hay Point Coal Terminal did impact on the site. This impact could be assumed to have affected natural drainage via scoured or natural gullies, cutting and removal of fill materials and potentially use of rock from the current quarry dam area. As such it is difficult to determine the layout of natural drainage and the overall original site profile.



The following site facilities or localities were identified as to where further remediation would be required.

- **Rail Loop;** re-grading and re-alignment of the rail corridor, supply and application of additional fill material and topsoil, progressive site profiling, further revegetation, seeding and watering
- **Rail Reveal pits;** supply and application of additional fill material
- **Rail Loop Dam;** supply and application of additional topsoil, progressive site profiling, further revegetation, seeding and watering
- **Whole of Stockyard;** general increase of the stockyard area to be remediated, increase in additional spreading of Bund materials, supply and application of additional fill material and topsoil, progressive site profiling, further revegetation, seeding and watering. Additional excavation and profiling for blending of benched areas on the western side.
- **The Stockyard Foreshore;** increase in excavation works and disposal of waste materials, supply and application of additional fill material and covering materials, progressive site profiling, further revegetation, seeding and watering
- **Quarry Dam;** supply and application of additional fill and topsoil, increase extent of and progressive site profiling, further re-vegetation, seeding and watering
- **Industrial Dam;** supply and application of additional fill and topsoil, increase extent of and progressive site profiling, further re-vegetation, seeding and watering
- **Outloading foreshore;** further excavation towards original contours and removal of waste material, supply and application of fill materials and covering materials, progressive site profiling, further re-alignment works to re-establish foreshore, further re-vegetation
- **Foundations associated with the 3 Surge Bins;** increase in excavation of foundation materials, removal of waste materials, supply and application of fill and covering materials, progressive site profiling and further re-vegetation
- **Whole of site;** increase in progressive site profiling, supply and application of fill and topsoil materials, adjustments to re-vegetation.

### 3.2 Alternate Estimate Pricing

We note the following in relation to estimate prices:

- The pricing structure for this alternate estimate remains the same as that utilised within the original independent estimate.
- The base date of Q42015 remains the same.
- Turner & Townsend have endeavoured to make procurement allowances based on typical material types to suit the overall site.
- Procurement, labour, plant and equipment rates remain unchanged

### 3.3 Alternative Estimate Quantities

Quantities that have been revised only pertain to the facility areas as nominated in Section 3.1.

Quantities were adjusted after review of the drawings to ascertain fill and re-profiling volumes against original reduced levels. Excavation quantities were increased in the foreshore areas only in order to restore the original foreshore alignment and to ensure there would be no impact from contaminated materials and structure foundations.

Attachment 1:  
Turner & Townsend Report dated 28 January 2016

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<p>F:\BNE\NATURAL RESOURCES\QCA - QLD COMPETITION AUTHORITY\BR23127 QCA DBCT SITE REHABILITATION\09 DELIVERABLES\BR23127 QCA DCBT SITE REHABILITATION REPORT 20160128 FINAL.DOCX</p>			



# 1 Executive Summary

Queensland Competition Authority (QCA) is currently assessing Dalrymple Bay Coal Terminal (DBCT) Management's revenue and pricing proposal included as part of the 2015 Draft Access Undertaking (DAU).

Turner & Townsend have been requested by QCA to review the proposed DBCT site rehabilitation costs for DBCT Management's 2015 DAU. This involves a desktop analysis to assess DBCT Management's submission, supporting material and stakeholder comment as well as advising on whether the projected costs are appropriate.

The report that we have used is the DBCT Management's Limited; Rehabilitation DBCT Report Update; Rehabilitation Valuation 2015 dated 15th September 2015 reference H350126-00000-224-230-0001 Rev 0 (2015 Rehabilitation Valuation).

## 1.1 Independent Estimate

Turner & Townsend has been requested to review DBCTM's proposed costs for rehabilitating the plant and facilities at DBCT site. To facilitate this, an independent estimate has been completed and the forecast cost is **A\$389.69M**.

This compares to the current 2015 Rehabilitation Valuation as follows:

Ref	Estimate	Estimate A\$M excluding GST
A	Turner & Townsend Independent Estimate (semi detailed estimate)	\$389.69
B	Hatch 2015 Full Rehabilitation Valuation	\$826.60

The Turner & Townsend independent estimate summary is shown in the following table:

Ref	Area	Estimate A\$M excluding GST	%
A	Rail Loop & Receival	17.74	4.6%
B	Inloading	9.43	2.4%
C	Stockyard	34.38	8.8%
D	Outloading	236.82	60.8%
E	Infrastructure/ Other Civil Works	20.90	5.4%
F	Site Generally	4.19	1.1%
G	Final Site Rehabilitation	66.22	17.0%
	<b>TOTAL</b>	<b>389.69</b>	



Independent estimate assumptions are:

- Q42015 base date including owners costs and contingency
- Excludes
  - Revenue from resale of the land
  - Staff redundancy costs
  - Salvage costs
  - Allowances for changes in current legislation.

## 1.2 Review of Rehabilitation Valuation 2015

We have reviewed the DBCT Management Limited; Rehabilitation DBCT Report Update; Rehabilitation Valuation 2015 dated 15th September 2015 reference H350126-00000-224-230-0001 Rev 0 (2015 Rehabilitation Valuation) and have the following observations:

Ref	Rehabilitation Valuation 2015	Observation
A	The duty to Rehabilitate clause 22 of the Port Services Agreement to return to its "natural state"	The application of a test of reasonableness would be a more appropriate assessment and in line with industry standards to "return of disturbed land to a stable and productive condition <sup>1</sup> ".
B	Factored approach	Although the process is an acceptable practice, without a defined approach to the determination of percentages applied the estimate is very subjective and possibly inaccurate. We believe a semi detailed approach would be more appropriate for the purposes of a DAU.
C	Activity to rehabilitate the site, treatment types	The treatment types proposed generally appear acceptable, although there are only seven types. We consider this is not sufficiently detailed to support an accurate estimate. We have proposed more defined scope assumptions as detailed in section 3 Basis of Scope.
E	Cost for "Full Rehabilitation" case	The overall costs do not appear to be reasonable due to the factors applied and methodology used.
F	Market Increase 2004 - 2015	Based on a composite index for rehabilitation costs in Queensland we would expect an increase of 47%.

<sup>1</sup> Based on Environmental Resources Management Australia Ltd high level assessment of 2015 Rehabilitation Valuation



### 1.3 Conclusion

We believe that the Rehabilitation Valuation 2015 option is somewhat prudent, although this may be too strict an interpretation of the Port Services Agreement rather than current industry standard practice.

The Rehabilitation Valuation costs are not efficient considering the factored approach application to capital costs, lack of defined approach to determining the factor applied and the extent of cost increase from “Do Minimal” to “Full Rehabilitation” scenario for no increase or comparatively very small increase in scope.

We also believe that the factored approach against asset valuation results in ‘double dipping’ of rehabilitation costs.

The basis of the Rehabilitation Valuation 2004, although not provided, is evidently fundamentally flawed by comparison to both the Turner & Townsend estimate and Rehabilitation Valuation 2015 after market increases are applied.





## 2 Introduction

On the 30th October 2015, Queensland Competition Authority (QCA) issued a tender titled 'Review of proposed DBCT site rehabilitation costs for DBCT Management's 2015 DAU'.

QCA is currently assessing Dalrymple Bay Coal Terminal Management's (DBCTM) revenue and pricing proposal included as part of the 2015 Draft Access Undertaking (DAU).

Ultimately, DBCTM proposes to fund these future costs through an annual remediation allowance, paid for by users through the Terminal Infrastructure Charge. In developing its proposed annual remediation allowance for the 2015 DAU, DBCT Management commissioned Hatch to provide an estimate of the projected costs of rehabilitating the plant and facilities at DBCT, based on the Hatch Report.

To assist with QCA's assessment, a review is required to determine whether DBCT Management's projected 'full rehabilitation projected costs', as assessed by Hatch, for rehabilitating the plant and facilities at DBCT, are reasonable and efficient.



### 3 Basis of Scope (for Independent Estimate)

Turner & Townsend's Scope of Work assumptions for our independent estimate is further defined by the following points.

#### 3.1 Preliminary Scope

- Design studies for demolition and removal procedures in respect of workable size and weight restrictions plus the sequencing of the removal process incorporating engineering and drafting disciplines
- Development of lift and transport studies incorporating engineering and drafting disciplines
- Development of individual Job Packs for each major item of plant and equipment
- Development of project management plans inclusive of safety, environmental, rehabilitation, remediation, constructability methodology, traffic, de-commissioning and isolation plans
- Project scheduling
- Obtaining of permits and site access
- Employee and staff generic and project specific induction training
- Staged isolations and disconnections of all energy sources
- Staged release of mechanical restraints such as conveyor take-ups, mechanical braking systems plus hydraulic and pneumatic controls.
- Installation of temporary and sacrificial support and bracing structures, conveyor belt clamping and access supports to help ensure safety within the removal process.

#### 3.2 Common Scope

- At the commencement of the rehabilitation process it is expected that all operational activities at the Terminal will have ceased and all coal held in storage at rail receipt stations through to shiploader conveyors has been fully cleared. It is understood that the stockyard area may hold a minimal covering of remaining coal
- In a similar vein, it is assumed that spillages in and around conveyors and transfer points will have been cleared and that in general there are no restrictions in gaining full access to the whole of site and all plant and equipment
- General electrical and mechanical equipment such as conveyor drives, belt feeders, motors, gear-boxes, transformers, wagon vibrators, winches, winch and luffing ropes, cable and hose reelers will be removed independently of supporting structures
- These items will then be transported to an off-site central storage or warehousing facility for onward considerations
- Conveyor belts will not be re-rolled on to reels. Belts will be cut into transportable sizes while being pulled and disposed of to landfill sites separate to the terminal site



- All structural, plate and pile steel will be demolished and cut into transportable sections to suit site restrictions only and then transported to a non-central site lay-down yard. From this point, Scrap Metal Merchants will be brought to site to further cut the steel into sizes for road transport off site
- Excavated concrete from slabs, plinths, footings, foundations, rail receival pits, rail sleepers, suspended slabs, conveyor floors, jetty and wharf decking will be put through a pulverising, crushing and screening process. A series of magnets will be used to assist with steel removal. The crushed concrete will be utilised as a fill material in large size voids combined with imported fill material. Surplus material will be transported to off-site landfill sites
- We have allowed for 6km of rail removal and removal from site
- All contaminated soils, waste and scrapped materials other than steel and concrete will be crushed on site as much as practical and then carted to off-site landfill sites
- The cartage of contaminated soil, waste and scrapped materials to landfill sites is based on a five hour return trip
- The estimate includes dumping fees for the disposal of all waste materials to landfill sites based on quotes from licenced and approved landfill sites
- The Estimate strategy does not include recovery costs for the possible re-sale of used plant and equipment or scrap steel
- The overall site will be graded and re-contoured. Additional imported fill material will be carted to site to allow final filling of voids and assist site profiling and with the industrial and rail loop dams
- Top soil will generally be manufactured on site with the addition of organic matter to fill material. Imported topsoil will also be used. Topsoil will be applied at minimal thickness of 100 mm
- Seeding and watering will be carried out to the whole of site once topsoil has been spread and profiled. The watering process and on-going monitoring will cease once rehabilitation is completed
- Elevated conveyor gantry sections will be cut from trestle supports, lifted and lowered to the ground prior to cutting and demolition completed
- Ground mounted conveyor structure will be progressively cut and demolished mechanically
- Once the major mechanical equipment is removed Transfer and Drive towers will be cut and demolished by mechanical and hydraulic grab and cutting machinery
- All site wide buried services will be isolated on a staged basis. This may also include the installation of temporary isolation points to allow continued use of services
- All buried services will be progressively excavated and removed, scrapped and disposed of



- With all site buildings such as offices, stores and warehouses it is assumed that the majority of office equipment will be removed by the relevant stakeholders of each facility prior to the remediation process commencing
- Buildings will be completely demolished with steel and concrete separated during the demolition process.

### 3.3 Inloading

- After the removal of the rail lines and sleepers from the rail loops, the ballast will be excavated and used as fill material in the larger voids, mixed with general fill material
- The concrete floors and walls of the rail receival pits will be completely excavated and demolished with the concrete being pulverised as mentioned previously. Strategically placed explosives will also be used to assist in collapsing side walls
- The conveyor under-pass on the Hay Point Road will be partially filled to assist with regaining the natural contour of the surrounding area. The road over-pass will not be interfered with
- Above ground services such as cable trays, cabling, dust suppression piping, water and air pipelines which are all structure mounted will be mechanically cut and removed from conveyors and structures prior to the complete demolishing of these items
- Loading and cartage of demolished materials and steelwork will follow the demolishing process in sequence
- Underground services will be excavated and removed from site.

### 3.4 Stockyard

- Yard machines will be parked in the storm park positions with booms mounted in the support cradles. All cable and hose reelers will be re-wound, discounted and removed
- Counterweights, counterweight booms and masts will be cut and grounded by controlled and engineered explosive cutting
- Machines will then be cut, demolished and scrapped in sequence from top to bottom
- The full length concrete retaining walls on bunds 4A and 5A will be demolished by excavator with the concrete being pulverised, crushed and used as fill material
- On a similar basis, all of the slabs and foundations for the bund mounted conveyors will be excavated and pulverised
- Above ground services such as cable trays, cabling, dust suppression piping, water and air pipelines which are all structure mounted, will be mechanically cut and removed from conveyors and structures prior to the complete demolishing of these items
- The eight existing bunds will be bulldozed and spread within the stockyard area to achieve an acceptable level with the surrounding area. Crushed concrete will be added to assist in achieving the required levels and contouring.



### 3.5 Outloading

- The surge bins will be cut into sections and lowered to the ground before final cutting
- The three shiploaders will be cut and dismantled in sections for crane removal and transported to a central location for removal from site. No allowances have been made for use of heavy lift ships for this operation
- Above ground services such as cable trays, cabling, dust suppression piping, water and air pipelines which are all structure mounted will be mechanically cut and removed from conveyors and structures prior to the complete demolishing of these items
- Off shore conveyors would be dismantled by cutting and freeing the individual gallery sections and transporting to shore prior to further cutting and demolition. Where possible, truck transport will be utilised in preference to the use of barges
- On a similar basis, conveyor trestles will be removed individually and transported back to shore
- Jetty and wharf concrete deck beams will be saw cut into 12 metre lengths and cross-sectional post tensioning strands will be mechanically cut to allow lifting of the deck beam units and transporting to shore
- The concrete deck beams will be pulverised and crushed as mentioned previously
- The remaining wharf and jetty structures such as fenders, dolphins, berthing strong points and headstocks will be systematically and sequentially cut and transported to shore for further cutting and demolishing
- It is envisaged that the jetty and wharf pylons will be cut off at sea-bed level. The pylons will be dual crane lifted and transported to shore for further cutting and demolishing. Concrete filled pylons will be split in an endeavour to separate concrete from steel for disposal purposes
- For the jetty and wharf works, the Estimate includes allowances for two dumb barges, two tug boats, one work boat and one rescue boat.

### 3.6 Infrastructure

- The industrial and rail loop dams will be drained of remaining water prior to removal of liners
- We have made a small allowance for contaminated soils and transported to registered landfill sites as we do not expect this to be an issue at DBCT site
- Embankments will be pushed into the dams and crushed concrete combined with imported fill will be added to achieve a level that allows for contouring to the levels of the surrounding area
- The seaward side embankments and side walls of the Quarry dam will be pushed inwards to eliminate its capacity to hold future water. Fill material will only be added to assist in contouring to stepped and graded levels
- The Flocculent Plant and all water pipelines will be dismantled, removed and scrapped.



### 3.7 Final Site Rehabilitation

- As part of the overall site rehabilitation the scope of work will include the excavation and removal of the concrete handbars which act as buffers along the foreshore. These items will be pulverised and crushed for re-use
- The reclaimed foreshore area in the vicinity of the transfer area to the jetty conveyors will be excavated in a manner to revert the area to its original profile
- Contaminated soils will be excavated and transferred to registered landfill sites.



## 4 Independent Estimate

### 4.1 Methodology

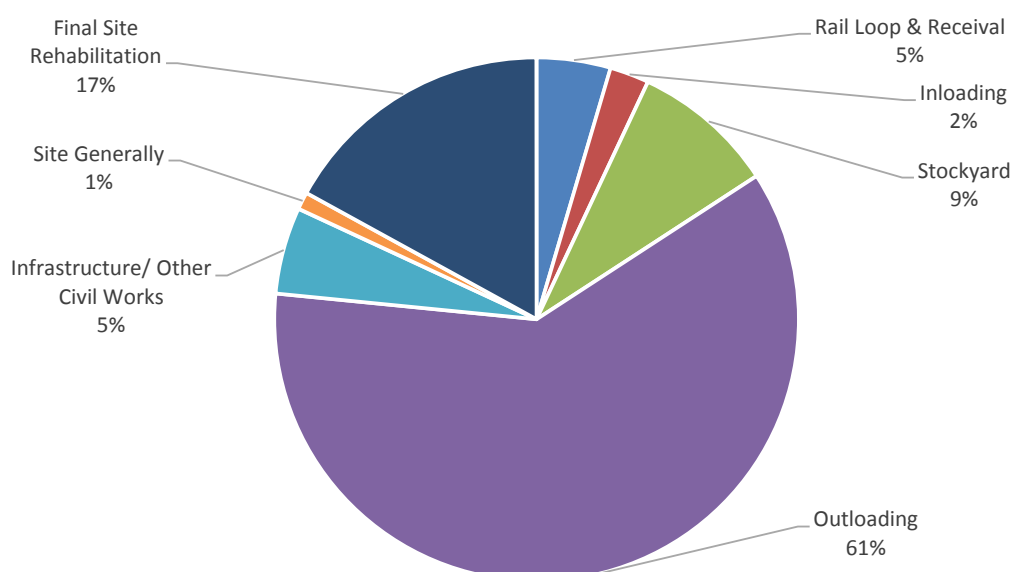
Turner & Townsend has developed an independent semi-detailed estimate for the rehabilitation of the DCBT site **to return the site to a safe and stable condition** as defined in section 5.1 of this report.

This is based on our experience of DCBT site, DBCT projects and site visit on 11/12/2015. Note that the site visit was on an escorted drive basis and does not represent a full site survey.

### 4.2 Independent Estimate

The forecast cost for the rehabilitation of the DBCT site is **A\$389.69M**, estimate summary is shown below and a more detailed estimate summary included in Appendix A with indirect costs and contingency shown (spread by Area below).

Ref	Area	Estimate A\$M excluding GST	%
A	Rail Loop & Receival	17.74	4.6%
B	Inloading	9.43	2.4%
C	Stockyard	34.38	8.8%
D	Outloading	236.82	60.8%
E	Infrastructure/ Other Civil Works	20.90	5.4%
F	Site Generally	4.19	1.1%
G	Final Site Rehabilitation	66.22	17.0%
	<b>TOTAL</b>	<b>389.69</b>	





### 4.3 Basis of Pricing

The Estimate has been built up on a 'first principles' basis where possible and achievable. Item descriptions and quantities have been developed from the drawings and information provided by DBCTM. The estimate structure has been developed and expanded upon by creating five level WBS item descriptions.

First principles estimating has been applied in compiling site construction labour, equipment and consumable rates. The construction hours have been formulated from using known, acceptable and achievable production rates on an 'hours per unit of' measurement basis. Additional non-working time factors have been applied to off-set lost time due to crib-breaks, pre-start meetings and general lost time activities.

An assumption has been made that the Project would have two separate contracts, that is, one for On-Shore works and the other for Off-Shore works, with the dividing battery limit being the commencement of the Jetty conveyors. The duration for each contract is based on an eighteen month timeframe.

The Estimate is based and structured around the following Cost Functions:

#### 4.3.1 Direct Costs

Off Shore Marine, On Shore Civil, Structural, Mechanical and Electrical for the following;

- Isolations and disconnections, demolition, removal and rehabilitation and remediation works
- Transport of equipment, scrap steel, waste materials and transport for disposal purposes
- Supply costs for temporary works, fill materials, topsoil, seeding and watering plus disposal fees and charges
- Pulverising, crushing and screening of concrete for re-use as fill material
- Sub-Contract works for specialised activities
- A growth allowance of 15% has been allowed for key earthworks sections.

#### 4.3.2 Construction Indirect Costs

- Pre-works, mobilisation, site running-costs, site overheads and project management
- Mobilisation and de-mobilisation for both labour resources and plant and equipment
- Site establishment and site running costs
- Off and on Site project management and supervision
- Site overheads and contractor profit margins.





#### 4.3.3 Owner's Cost

- Project Define Stage
- Project Execution
- Project Close-out stages
- Running and operational costs
- Sub-Contract costs for Geo-technical surveys, on and off-shore
- Sub Contract costs Environmental and Remediation reporting, monitoring and general requirements.

#### 4.3.4 Estimate Criteria

- The Estimate is expressed in Australian Dollars (A\$)
- The Estimate base date 4Q2015.

#### 4.3.5 Contingency

- We have assessed contingency as 20% as this is based on assumed scope for rehabilitation.

#### 4.3.6 General Qualifications, Inclusions and Exclusions

##### 4.3.6.1 Taxes

- Goods and Service Tax (GST) has been excluded from all pricing
- Fuel rebates have not been considered.

##### 4.3.6.2 Q-Leave

- Q-Leave has not been included in the Rehabilitation Cost Estimate. Clarification would be required as to whether this Project would be classified as requiring the addition of Q-Leave or whether DBCTM would apply their own internal allowance. The current gazetted Levy of 0.475% can be applied to the overall Estimate Value if required.

##### 4.3.6.3 Labour

- For the purpose of wage structure and employee entitlements, Turner & Townsend has utilised a current Brownfields Agreement that would be applicable to either a Tier 1 or 2 Contractor. A Greenfield Construction Agreement has not been considered as a requirement. Hourly rates and entitlements have been built-up on a first principles basis for normal time and overtime allowances with social and statutory obligations such as leave entitlements, superannuation and payroll tax included
- The social entitlements include the following; Annual Leave, Leave Loading, Personal Leave, Long Service and Redundancy
- Statutory allowances include the following; Superannuation, Work Cover, Payroll Tax, Fringe Benefit Tax, Income Protection.



#### 4.3.6.4 Equipment

For estimating purposes equipment has been categorised into two sections:

##### 1. Major Equipment inclusive of:

- Earthmoving machinery such as dozers, excavators, scrapers, front end loaders, graders, backhoes, trucks, semi-trailers and water carts plus concrete crushing and screening plants
- Large craneage inclusive of 250 and 150 ton crawler cranes, 80 to 50 ton All Terrain cranes
- Marine equipment inclusive of barges, tugs, work boat, rescue boat and pile cutting equipment
- All Major Equipment has been priced on daily and weekly hire rates. Marine equipment is on wet hire basis inclusive of dedicated operators. All other major equipment is on a dry hire basis.
- Site durations will vary with staggered commencement and finishing dates on an “as required” basis. Not all earthmoving equipment will remain on site for the duration of the works.

##### 2. General equipment is inclusive of:

- All light vehicles inclusive of buses
- Non Slew Cranes and Elevated Work Platforms
- Construction plant such as welding machines, air-compressors, generators and the like
- Containers of small tools
- Scaffolding
- All general equipment has been priced for the project duration
- Mobilisation of equipment costs are based on mobilising from an area radiused by the area from Townsville to Gladstone.

#### 4.3.6.5 Consumables

- Consumables such as fuels and oils for all equipment, maintenance supplies, safety items plus all general construction consumables along with crib and ablution supplies have been included.

#### 4.3.6.6 Inclement Weather Delays

- When considering the project duration it is probable that two wet seasons will be encountered during the course of the works
- An allowance for lost time due to inclement weather has been included. This equates to 15% of all man-day shifts
- The total cost for Inclement Weather Delays is nominated at A\$39M.



#### 4.3.6.7 Commercial Terms and Conditions

- Costs for insurance premiums and allowances have been included. These allow for contract works, public liability, construction plant and equipment insurances
- No consideration has been made for the successful Contractor's exposure to Liquidated Damages or Consequential Loss
- A security cost allowance has been included within the estimate based on 1.5% of 10% of the Contract Value.

#### 4.3.6.8 General Qualifications

- It is assumed that take-off points for potable and construction water are accessible within close proximity of the major site facilities
- Procurement allowances have been included for the purchase of potable and construction water
- Allowance has been included for the pump-out and disposal of all ablution waste and general rubbish removal
- Statutory approvals from Local, State and Federal Governments are assumed as not being required
- Accommodation allowances have been made for an equivalent of 30% of the workforce
- Generally the Estimate is based on an eighteen month duration averaging 5.5 days per week and 10 hour working days
- No allowance for night shift working has been included
- With the electrical Power distribution termination has been based on the Port's boundary and does not allow for off-site removal of wires and poles. Likewise terminations have not been included for off-site sub-stations
- Continual watering and monitoring of the site after the completion of the Rehabilitation Project is excluded from the estimate. Watering and monitoring is included on a progressive basis as the works are completed progressively
- In respect of the current on-site operations of both DBCT Operations and DBCT Management the following points on Human Resources and Community apply;
  - No allowances have been made for Redundancy or Long Service payments
  - No consideration has been given to Re-deployment costs
  - No consideration has been given to the associated re-training of employees
  - No allowance has been made to continue with community funding for any purpose
  - No allowance has been made for the establishment of any future Trust Funds for future considerations.
- External cost considerations for financing the Project have been excluded



- No allowance from revenue from the resale of the land
- There has been no allowance or cost deductions made in respect of the on-ward sale of plant, equipment, spares, fuels, lubricants or materials. Likewise, the re-sale of scrap steel has been considered however it has been determined that the cost of transport and shipping would outweigh any re-sale benefits
- An allowance for legal costs associated with discharging DBCT site and DBCTM contracts has been included.



## 5 Review 2015 Rehabilitation Valuation

The report that we have used is the DBCT Management Limited; Rehabilitation DBCT Report Update; Rehabilitation Valuation 2015 dated 15<sup>th</sup> September 2015 reference H350126-00000-224-230-0001 Rev 0 (2015 Rehabilitation Valuation).

### 5.1 Response to Stakeholders

#### 5.1.1 Vale letter dated 24 November 2015 – Remediation Cost Allowance

In the Vale letter there are a number of considerations we have been requested to provide comments as follows:

Ref	Consideration	Comments
A	Vale does not believe allocating the high point estimate is appropriate	<p>There is a risk of strict interpretation of the Port Services Agreement that may require the site to be returned to its Natural State. However, considering the reasonableness wording in this agreement, the likely rehabilitation work scope may be to return the site to a safe and stable condition, appropriate for the likely (open land) use<sup>2</sup>, defined in section 5.2 below.</p> <p>Also, considering the issues with the percentages used in the 'Full Rehabilitation' case, listed in section 5.5 below, we would probably support this comment.</p>
B	Potential changes in technologies over the life of the lease could provide alternative remediation options at lower costs	<p>The factored approach used in the 2015 Rehabilitation Valuation does not provide the detail to support the assessment of opportunities for technological improvements.</p> <p>Our independent estimate is based on current known facts.</p> <p>There is the possibility of technological improvements. We are not aware of any that are currently under development that may significantly affect cost.</p> <p>There is also a risk that future more stringent new environmental legislation could offset any technological advances.</p>

### 5.2 Duty to Rehabilitate the Site

#### 5.2.1 Environmental Resources Management Australia Ltd

Turner & Townsend has engaged a sub-consultant to provide a high level assessment of DCBTM's obligation to rehabilitate the site under the Port Services Agreement, current legislation and industry standard practice as detailed in Section 5.2 of this report.

<sup>2</sup> Based on Environmental Resources Management Australia Ltd high level assessment of 2015 Rehabilitation Valuation



### 5.2.2 Regulatory Framework

In Queensland, rehabilitation is required under the Environmental Protection Act 1994 (EP Act), which has as its objective, the attainment of ecologically sustainable development (ESD). The principles in the National strategy for ecologically sustainable development (NSES) must be considered in decision-making under the EP Act. Section 4(6) of the EP Act requires that all reasonable and practicable measures are taken to protect environmental values from all sources of environmental harm and requires persons who cause environmental harm, to pay costs and penalties for the harm. The fundamental reasons for rehabilitation are to reduce the apparent disturbance caused by authorised activities and to minimise the potential for future environmental harm.

### 5.2.3 Lease Obligations

Dalrymple Bay Coal Terminal Management (DBCTM) has an obligation to rehabilitate the terminal site under the Port Services Agreement (PSA) with DBCT Holdings. DBCT Holdings is a wholly owned Queensland Government entity which owns DBCT and leases the terminal to DBCTM.

Lease of the terminal began on 15 September 2001, with a term of 50 years. The DBCT lease agreement states that the Primary Lessee must rehabilitate the premises at its cost within 3 years after the end of the onshore agreement.

In this context, the definition of remediation is to remediate the onshore and offshore lands to their natural state and condition as existed prior to any development of construction activity having occurred.

Under the Port Services Agreement "Rehabilitate" means to:

- remove the Plant and other structures, fixtures, fittings, plant and equipment from the Onshore Land and Offshore Land and dispose of them in accordance with applicable laws
- remediate the onshore land and offshore land to its natural state and condition as existed prior to any development or construction activity having occurred on the premises.

It is also noted that the definition includes the following: The Primary Lessee must:

- Rehabilitate in accordance with any applicable laws
- Rehabilitate in accordance with DBCT Holdings' reasonable conditions and requirements
- Provide such reports regarding Rehabilitation that DBCT Holdings may reasonably require.

The reference to applicable laws and reasonableness provides an appropriate framework for rehabilitation planning, rather than returning the site to natural condition.

### 5.2.4 Environmental Authority

The Environmental Authority (EA) held by DBCT Pty Ltd is for the environmentally relevant activities of:

- ERA 50(2) Bulk material handling - loading or unloading 100t or more of bulk materials in a day or stockpiling bulk materials; and



- ERA 63 Sewage treatment 1(b)(ii) - operating sewage treatment works, other than no-release works, with a total daily peak design capacity of more than 100 but not more than 1500EP otherwise.

### 5.2.5 Industry Standards

In relation to mining related activities the International Council on Mining and Metals (ICMM) has published detailed guidance of closure planning, as documented in Planning for Integrated Mine Closure: Toolkit (January 2011).

Although not specifically relating to coal terminal facilities, this advocates a risk based approach to rehabilitation planning, and is useful reference for anticipated closure planning baseline. Decommissioning and post closure planning should entail:

- Engineering works to decommission and dismantle infrastructure, complete rehabilitation, grade landforms for effective drainage, implement post closure monitoring networks, etc.
- Administrative works relating to the transfer of assets, labour force demobilisation, relinquishment agreements and other government and NGO agreements
- Due diligence monitoring and reporting on the post-decommissioning status of environmental and social aspects of the site.

The Planning for Integrated Mine Closure: Toolkit (January 2011) defines rehabilitation as "the return of disturbed land to a stable and productive condition" which is a much more achievable level to reach compared to that outlined in the Port Services Agreement.

Similarly, the Australian and New Zealand Minerals and Energy Council (ANZMEC) and the Minerals Council of Australia (MCA) jointly published the Strategic Framework for Mine Closure (ANZMEC 2000). The framework recognised that the mining industry is responsible for rehabilitation of mine disturbance in an environmentally and socially acceptable way. It considered mine planning, stakeholder involvement, financial provisioning for rehabilitation, implementation, standards and relinquishment; and developed the following key principles:

- legislation should provide a broad regulatory framework for the mine closure process; standards of rehabilitation should be acceptable and achievable
- completion criteria are specific to each mine and should reflect its unique set of environmental, social and economic circumstances
- an agreed set of indicators should be developed to demonstrate that successful rehabilitation has been achieved
- targeted research will assist both government and industry in making better decisions about rehabilitation.

There is no indication from a legislative perspective that DBCT cannot be rehabilitated to a stable condition that is suitable for all uses and comply with relevant policy and guidance.

This approach is consistent with terminal rehabilitation requirements at other similar assets.



### 5.2.6 Relevant Legislation

Summary of relevant environmental legislation is shown in Appendix B.

### 5.2.7 Review of Existing Proposed Scope

The current closure and rehabilitation estimate commissioned by DBCT has three options for closure planning, as follows:

- 1 **Mothball option** – shut down and secure asset to remain in place for 20 years, with future potential to become operational again
- 2 **Partial demolition and decommissioning (minimal rehabilitation) to ground level** – demolition of asset and remove to ground level leaving sub terrain parts of asset (e.g. foundations) intact
- 3 **Full site clearance and rehabilitation** – restore site to original condition.

A review of the categories of treatment types proposed in the existing rehabilitation report is included in Annex A. The proposed rehabilitation scenarios used in the original rehabilitation report for each asset have also been tabulated and are included in Annex A.

The rehabilitation cost was calculated as a percentage of the unit replacement cost for each asset (with the exception of marine structure removal which was based on a historic cost estimate from a contractor). The assumption was made that the cost of de-construction was directly linked to the cost of construction.

Neither the minimal work scope, nor full rehabilitation, are likely to be acceptable and/or required. Removal of structures to an agreed depth and re-profiling are likely to form part of a technically defensible and practicable scope.

### 5.2.8 Most Likely Rehabilitation Requirements

In the event of site closure, the likely rehabilitation work scope will be to return the site to a safe and stable condition, appropriate for the likely (open land) use. This complies with the industry standard of “return of disturbed land to a stable and productive condition”.

Although the lease states there is an obligation to “remediate the Onshore Land and Offshore Land to its natural state and condition as existed prior to any development or construction activity having occurred on the Premises” Clause 22.4 goes on to state “(b) Rehabilitate in accordance with DBCT Holdings’ reasonable conditions and requirements;”.

This reasonable conditions clause is significant as it is likely to preclude any requirement to rehabilitate to a higher standard than is required for open space use.

As such the reasonable and practicable outcome is likely to broadly consist of the following:

- Demolition of above ground structures (offices, workshops, etc.)
- Removal of demountable structure
- Offsite disposal of non-inert waste from structures
- Demolition and recycling of steel structure
- Breaking out of concrete to a reasonable depth (typically 1.5 m below ground surface)





- Crushing concrete
- Backfill voids with crushed material
- Removal of tarmac and removal from site for recycling or disposal
- Re-profiling of site contours to allow natural site drainage
- Placement of subsoil across contoured area (from historic bunds)
- Import topsoil or compost organic waste to provide growth medium and subsequent seeding
- Break out of marine piles to sediment level, transport to land for crushing and reuse
- Removal of jetty structures for recycling (steel) or crushing (concrete) as appropriate.

Notwithstanding the above general closure scope, asbestos has been identified in structures, and localised soil contamination has been identified associated with an historic diesel spill, and specific mitigation will also be required around these issues.

### 5.2.9 Summary

To achieve site rehabilitation to a standard that achieves “the return of disturbed land to a stable and productive condition”, it is thought a combination of option two and three as outlined in Section 5.2.7, would be a reasonable and practicable rehabilitation scope.

In broad terms the scope would require partial removal of structures and reinstatement, as opposed to leaving slab foundations, roads, parking or footpaths in place or full return to a greenfield condition.

This would involve removal of infrastructure and assets to a sub-ground level and reinstatement of landforms and vegetation cover proving relatively straightforward for onshore, rather than restoration of all conditions to pre-existing conditions.

Removal of jetties and marine piles poses a technical challenge, however it is unlikely to be considered necessary (or reasonable and technically achievable) to rehabilitate the marine piles back to original condition.

Much of the decommissioning involves recycling of demolition materials and crushing and reuse of concrete on site, and as such it is likely that detailed costing of the scope by Turner & Townsend will result in a materially different cost estimate to that it is assumed based on a percentage of Asset Valuation.

### 5.3 2015 Rehabilitation Valuation Process

The process adopted in the 2015 Rehabilitation Valuation is a factored approach by applying a percentage to the Asset Valuation to determine the cost for rehabilitation. As a methodology this should only be used as a high level indication of costs due to sensitivity.

However, although the process has used Asset Valuation and applied a factored approach, there is no basis for the calculation of the percentages allowed, and this results in a very subjective assessment of costs.

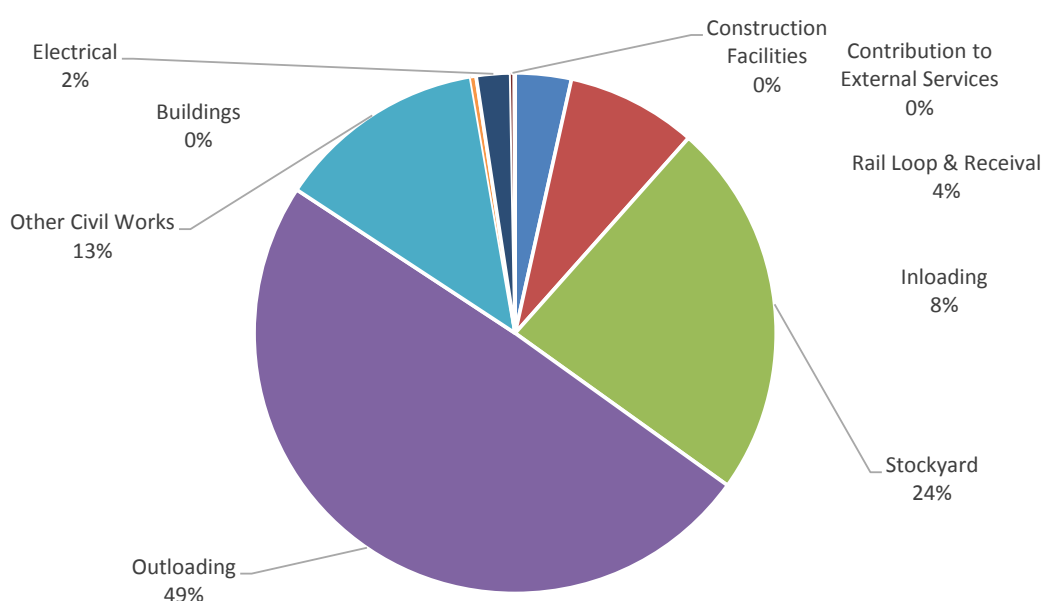


We would have expected a calculation to determine percentages applied by determining the installation cost only and applying a factor to the installation costs only. The percentages applied appear to be consistently 10%, 20% etc., that determines the sensitivity in this approach in units of 10%, which we consider is a significant weakness in the approach.

Also, the percentages applied have been linked to the rehabilitation treatment without consideration of the cost of materials that is included in the Asset Valuation. For example there are elements with very high supply costs that should attract a lower percentage and elements that have lower supply costs that should attract a higher percentage. This approach is a weakness and contributes to the potential inaccuracy of the estimate both of which under this process have the same percent applied.

A key issue with factored approach for all of the Asset Valuation is there is a high likelihood of “double dipping” of costs, where costs have been included.

Ref	Area	Estimate A\$M excluding GST	%
A	Rail Loop & Receival	28.77	3.5%
B	Inloading	66.91	8.1%
C	Stockyard	193.92	23.4%
D	Outloading	409.43	49.4%
E	Other Civil Works	107.75	13.0%
F	Buildings	2.83	0.3%
G	Electrical	17.64	2.1%
H	Construction Facilities	1.70	0.2%
J	Contribution to External Services	0.48	0.1%
	<b>TOTAL</b>	<b>829.43</b>	





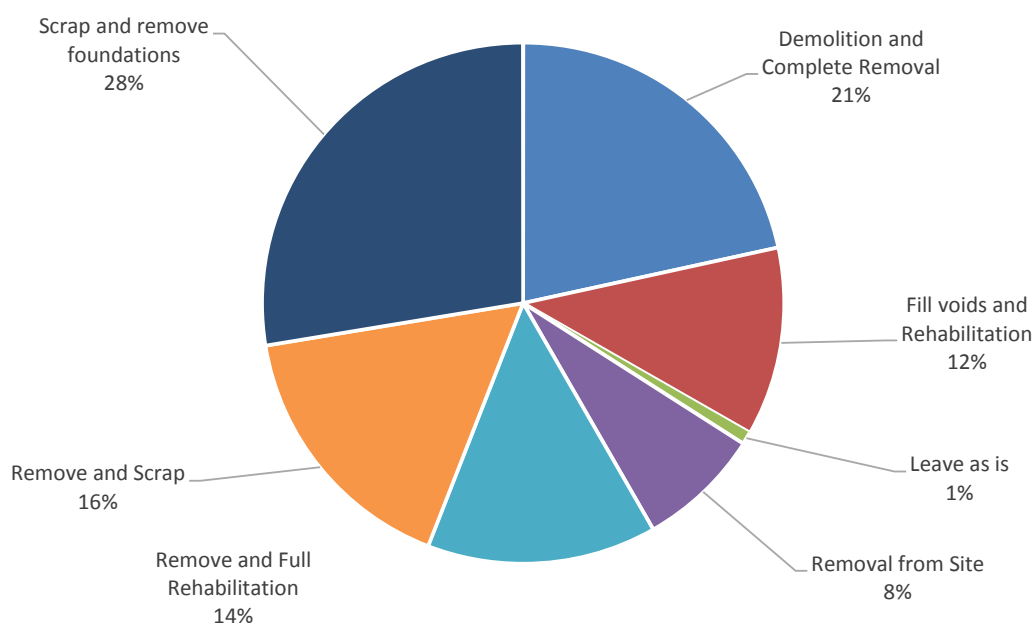
**NOTE:** There is a A\$2.9M rounding error in Hatch 2015 Rehabilitation Valuation, Rehabilitation Summary is A\$826.6M (Round up to Millions) and total of the Full Rehabilitation valuation is A\$829.43M (Full detail).

## 5.4 2015 Rehabilitation Valuation “Full rehabilitation” Review

### 5.4.1 Analysis of Allocation ‘by Treatment’

Analysis of the 2015 Rehabilitation Valuation shows there are only seven high level scope items used and these have primarily been used to set the factors applied to the Asset Valuation to estimate the costs for rehabilitation.

Ref	Rehabilitation Treatment	Estimate A\$M excluding GST	%
A	Demolition and Complete Removal	179.01	21.6%
B	Fill voids and Rehabilitation	97.03	11.7%
C	Leave as is	6.42	0.8%
D	Removal from Site	63.46	7.7%
E	Remove and Full Rehabilitation	117.99	14.2%
F	Remove and Scrap	136.64	16.5%
G	Scrap and remove foundations	228.88	27.6%
	<b>TOTAL</b>	<b>829.43</b>	



Considering the complexity of the DCBT site this is a very high level approach to scope definition.



#### 5.4.2 Observations on Allocation 'by Treatment'

Ref	Treatment	Description	Comment
A	Demolition and Complete Removal	Demolition and complete removal of asset above and below ground	Unlikely to require all below ground assets unless they have a degradation issue
B	Fill voids and Rehabilitation	Fill in assets such as dams with soil and restore site to original condition	Reasonable treatment and description
C	Leave as is	'Make safe' and leave asset in current condition	Reasonable treatment and description
D	Removal from Site	Removal from site as a whole	Unlikely to require all below ground assets unless they have a degradation issue
E	Remove and Full Rehabilitation	Restore site to original condition	Unlikely to require all below ground assets unless they have a degradation issue
F	Remove and Scrap	Remove asset as a whole and salvage, it is assumed the salvage value is 5%, therefore the resulting net cost is the removal cost less 5%	Reasonable treatment and description
G	Scrap and remove foundations	Remove asset as a whole, as well as sub-terrain foundations, and salvage. It is assumed the salvage value is 5%, therefore the resulting net cost is the removal cost less 5%	Unlikely to require all below ground assets unless they have a degradation issue

Some key observation regarding the costs in Hatch's 'Full Rehabilitation' estimate are:

1. **Rail Loop & Receival:** Rail Receival Pit 1&2 has a factor of 100% (A\$14M) of the Asset Valuation. However, considering Civil & Concrete works is separate to this, these may be the costs for the Materials Handling Equipment, and if this is the case, a factor of 10% has been used elsewhere.
2. **Rail Loop & Receival:** RRP1 & RRP2 – Civil and Concrete works has a factor of 50% (\$14M) of the Asset Valuation to "Demolish and removal to ground level", as the majority of the costs in this structure are below ground, 50% may be very conservative.



3. **Rail Loop & Receival:** Rail Receival Pit RRP3 from Stage 7X Phase 1 has been assessed to a lower level of detail than Stages 1 to 5 and has a factor of 100% (A\$22M) for the Asset Valuation.
4. **Inloading:** Conveyor S13 was constructed in a live operating environment and consequently S13 rehabilitation cost (A\$14M) is a significantly higher cost than Conveyor S3 (A\$2.3M) and Conveyor S4 (A\$1.7M) that are of a similar length.
5. **Stockyard:** Stacker/ Reclaimers, Stacker and Reclaimers have zero cost in the Do Minimal case.
6. **Stockyard:** Bulk Earthworks (A\$8M) should leave as is, as this will be for original site levelling and profiling.
7. **Stockyard:** Bunds 4A, 5A & 6 (A\$38M) have a factor of 40% of the Asset Valuation. However, considering this is an earth filled bund with reinforced concrete retaining walls to Bunds 4A & 5A, we would expect costs to be significantly lower.
8. **Outloading:** Berth 1 to 3 structures has a factor of 80% (A\$140M) of the Asset Valuation This compares to the Jetty estimate (A\$22m) in Appendix G of the Hatch Report.
9. **Other Civil Works:** Dams have a factor of 100% (A\$97M) of the Asset Valuation. Considering these are pits that can be backfilled with material on site, we would expect this cost to be significantly lower.
10. **Final Site Rehabilitation:** This has not been considered in the Hatch estimate due to methodology used.
11. **Contingency:** This has not been considered in the Hatch estimate due to methodology used.

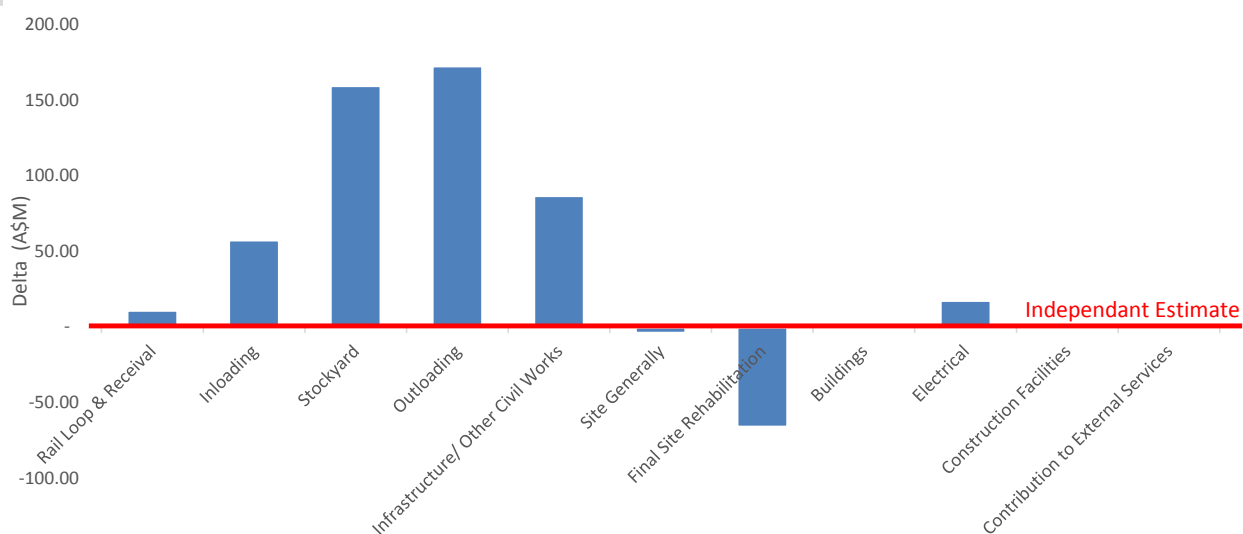
This is not intended to be an exhaustive list or assurance review. It is intended to highlight possible reasons for differences between estimates, other than methodology.



## 5.5 Comparison of Independent Estimate with Hatch “Full Rehabilitation” Estimate

The following table compares Turner & Townsend independent estimate with the Hatch ‘Full Rehabilitation’ estimate.

Ref	Area	Independent Estimate A\$M excluding GST	Full Rehabilitation Estimate A\$M excluding GST	Delta	%
A	Rail Loop & Receival	17.74	28.77	11.02	62.1%
B	Inloading	9.43	66.91	57.48	609.5%
C	Stockyard	34.38	193.92	159.54	464.0%
D	Outloading	236.82	409.43	172.60	72.9%
E	Infrastructure/ Other Civil Works	20.90	107.75	86.85	415.6%
F	Site Generally	4.19		- 4.19	-100.0%
G	Final Site Rehabilitation	66.22		- 66.22	-100.0%
H	Buildings		2.83	2.83	100.0%
J	Electrical		17.64	17.64	100.0%
K	Construction Facilities		1.70	1.70	100.0%
L	Contribution to External Services		0.48	0.48	100.0%
	<b>TOTAL</b>	<b>389.69</b>	<b>829.43</b>		



### 5.5.1 Key Observations

Inloading, Stockyard and Infrastructure/ Other Civils show the largest variance. This may be due to the factors applied to below ground structures, earthworks and bunds not being reflective of the treatment methodology as these represent between 80% and 100% of the Asset Valuation.

## 5.6 Comparison Hatch ‘Do Minimal’ and ‘Full Rehabilitation’ Estimate

The following table compared the 2015 Rehabilitation Valuation costs for ‘Do Minimal’ and ‘Full Rehabilitation’ scenarios, grouped by the scope change defined.



Ref	Rehabilitation Treatment -Do Minimal	Rehabilitation Treatment -Full Rehabilitation	Do Minimal Estimate ASM excluding GST	Full Rehabilitation Estimate ASM excluding GST	Variance
A	Demolition and Removal to Ground Level	Demolition and Complete Removal	8.40	14.00	67%
B		Remove and Full Rehabilitation	46.29	70.73	53%
C	Fill voids	Remove and Full Rehabilitation	35.36	45.58	29%
D	Leave as is	Fill voids and Rehabilitation	77.62	97.03	25%
E		Leave as is	-	6.42	
F	Removal from Site	Removal from Site	0.24	0.24	0%
G		Remove and Full Rehabilitation	1.68	1.68	0%
H	Removal to Seabed Level	Demolition and Complete Removal	86.04	160.18	86%
J		Removal from Site	47.41	63.22	33%
K	Remove and Scrap	Demolition and Complete Removal	3.22	4.83	50%
L		Remove and Scrap	6.81	136.64	1907%
M		Scrap and remove foundations	124.51	228.88	84%
	<b>TOTAL</b>		<b>437.59</b>	<b>829.43</b>	<b>90%</b>

Some key observation regarding the costs comparing Hatch 'Do Minimal' and 'Full Rehabilitation' estimates are:

1. **'Fill Voids' to 'Remove and Full Rehabilitation'** is a significant increase in scope yet represents an increase of 29% (A\$10M)
2. **'Removal to Seabed' to 'Demolition and Complete Removal'** is a relatively small increase in scope yet represents an increase of 86% (A\$160M).
3. **'Remove and Scrap'** in both cases with no evidence of difference in scope represents an increase of 1,907% (A\$136M).
4. **'Remove and Scrap' to 'Scrap and remove foundations'** is a very small increase in scope yet represents an increase of 84% (A\$137M).

These all appear to be due to the factors applied not being consistent with the rehabilitation treatment defined.

The overall increase from the Hatch 'Do Minimal' and 'Full Rehabilitation' scope is 90% (\$392M) which for the increase in scope is higher than expected.

## 5.7 Value Improvement Opportunities

Provided the integrity of the structure is sound, the most significant value improvement would be to retain the off-shore structures and only remove the materials handling equipment and infrastructure.

The off-shore structures may have a future beneficial use and removing them may negatively impact the marine environment due to the substantial demolition work required.

A small study team to investigate the possibility of this option, would inform the DBCT Management Team, if the retention of off shore structures is an option that is worth further investigation and development. This will then provide the basis for a development framework and plan to gain consensus and potential head of agreement.

This concept could further extend to the common infrastructure on site related to HV power, telecommunications, water and sewerage, dams, site roads, buildings and warehouses, perimeter fencings and security gates.



There may be technological advances in the demolition of marine structures. An element of market engagement may realise some potential value improvements in the future.

It is unlikely to be any significant value improvement opportunities with the on shore component for the rehabilitation works as we have assumed rehabilitation is to **return the site to a safe and stable condition** using industry standard demolition and remediation techniques.





## 6 Review of Market Increase 2004 to 2015

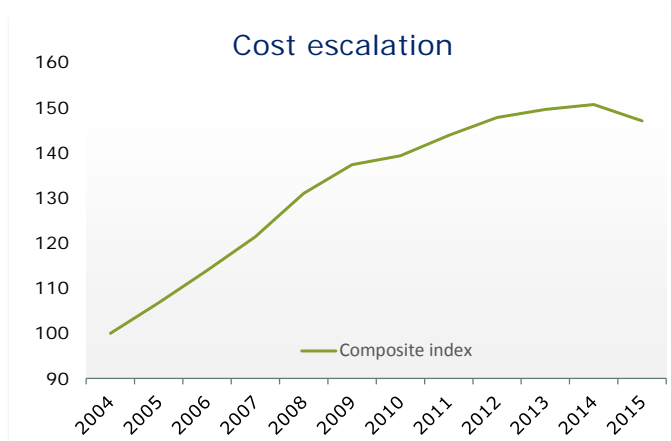
In order to review market increases for rehabilitation costs in Queensland we have developed a weighted composite index specifically for DCBT Rehabilitation.

To achieve this we have modelled the following commodity codes the ratio of expected for a rehabilitation project using the following indices:

Ref	Resource Group	Index Proposed
A	Engineering & Management	Australian Bureau of Statistics; 6345.0 Wage Price Index, Australia, Table 5b. Total Hourly Rates of Pay Excluding Bonuses: Sector by Industry, Original (Quarterly Index Numbers), Series ID: A2603019J (Quarterly Index; Total hourly rates of pay excluding bonuses; Australia; Private; Construction).
B	Construction Labour	Australian Bureau of Statistics; 6345.0 Wage Price Index, Australia, Table 5b. Total Hourly Rates of Pay Excluding Bonuses: Sector by Industry, Original (Quarterly Index Numbers), Series ID: A2603019J (Quarterly Index; Total hourly rates of pay excluding bonuses; Australia; Private; Construction).
C	Construction Plant	Australian Bureau of Statistics; 6427.0, Producer Price Indexes, Australia, Table 12. Output of the Manufacturing industries, division, subdivision, group and class index numbers, Series ID: A2307785X (Index Numbers; 2462 Mining and construction machinery manufacturing).
D	Fuel	Australian Institute of Petroleum, Average Diesel Terminal Gate Price.

We have not used an index for materials as there is minimal imported materials.

Based on Turner & Townsend Rehabilitation composite index, we expect that the cost uplift from 2004 to 2015 should be 47%.

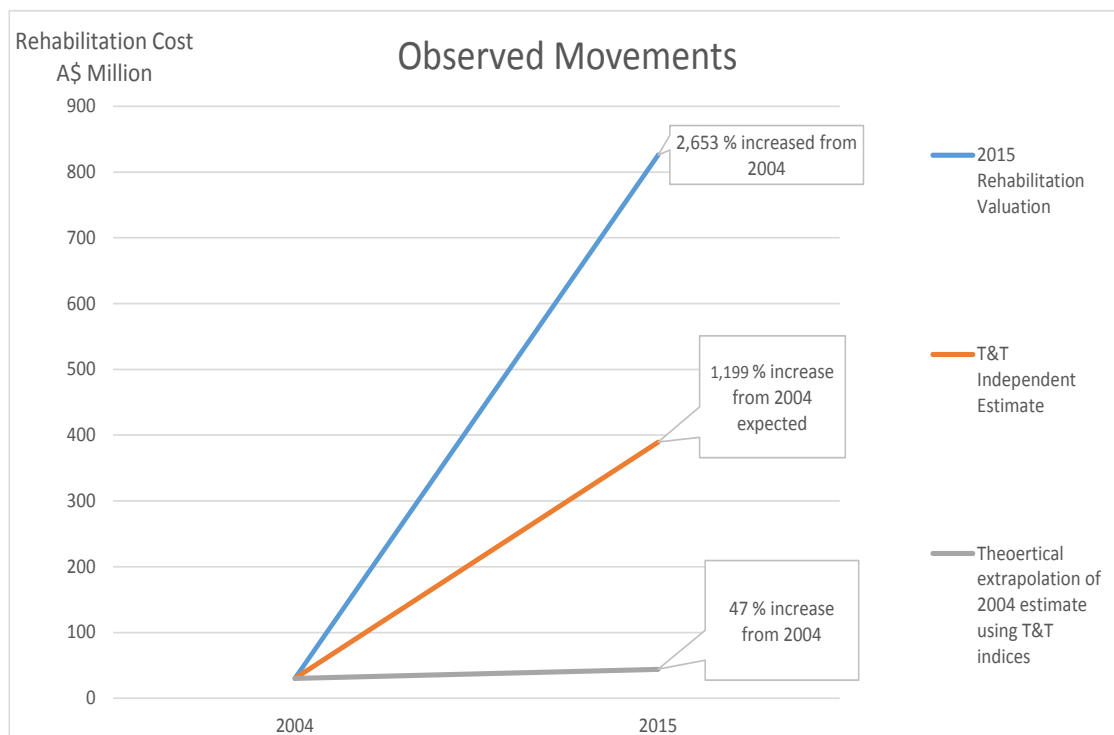




We derived their respective proportions of total project costs and used them as weightings to apportion appropriate indices, we sourced from the ABS for these items, to create a composite index.

Year	Proposed	Fuel	Construction labour	Engineering & Management	Plant
2004	100	100	100	100	100
2005	107	118	105	106	105
2006	114	133	111	116	108
2007	121	128	115	129	113
2008	131	157	121	142	116
2009	137	116	126	148	135
2010	139	123	130	150	136
2011	144	141	135	155	136
2012	148	143	140	159	140
2013	150	146	145	160	141
2014	151	145	149	162	141
2015	147	120	151	157	141

Further analysis to understand the change in costs between 2004 and 2015 Rehabilitation Valuations Turner & Townsend Independent Estimate is shown in the graph below:



The basis of the Rehabilitation Valuation 2004, although not provided is evidently fundamentally flawed by comparison to both the Turner & Townsend estimate and Rehabilitation Valuation 2015.



## Appendix A - Independent Estimate Summary

Ref	Area	Estimate A\$M excluding GST	%
	<b>DIRECT COSTS</b>		
A	Rail Loop & Receival	7.57	1.9%
B	Inloading	4.02	1.0%
C	Stockyard	14.67	3.8%
D	Outloading	101.08	25.9%
E	Infrastructure/ Other Civil Works	8.91	2.3%
F	Site Generally	1.79	0.5%
G	Final Site Rehabilitation	28.27	7.3%
	<b>INDIRECT COSTS</b>		
H	Contractor Preliminaries	2.41	0.6%
J	Construction Management	20.06	5.1%
K	On Shore Mob & De-mob	1.59	0.4%
L	Off Shore Mob & De-mob	1.62	0.4%
M	On Shore Site Est & Dis Est	0.52	0.1%
N	Off Shore Site Est & Dis Est	0.63	0.2%
O	Site Running Costs	6.37	1.6%
P	Accomm	8.96	2.3%
Q	On Shore Major Equipment	8.49	2.2%
R	Off Shore Major Equipment	7.69	2.0%
S	General Equipment	5.18	1.3%
T	Consumables	5.80	1.5%
U	Final Handover	0.24	0.1%
V	Contractor Indirects	67.46	17.3%
W	<b>INDIRECT COSTS</b>		
X	Owner's Cost	21.40	5.5%
	<b>CONTINGENCY</b>		
Y	Contingency	64.95	16.7%
	<b>TOTAL</b>	<b>389.69</b>	



## Appendix B – Relevant Environmental Legislation

Title	Relevance to the Activity
<b>Commonwealth Legislation</b>	
<i>Environment Protection and Biodiversity Act 1999 (EPBC Act)</i>	The EPBC Act implements Australia’s obligations to protect and conserve biodiversity and heritage under a range of international treaties and agreements. In relation to projects, the Act requires assessment and approval of actions that may have a significant impact on a range of matters of National Environmental Significance, including threatened species and ecological communities, migratory species, World Heritage areas and national heritages places.
<i>Native Title Act 1993</i>	The <i>Commonwealth Native Title Act 1993</i> (NT Act) formalises the common law recognition of ancestral domain or native title, that is rights and interests over land and water possessed by Indigenous people in Australia under their traditional laws and customs.
<i>National Environment Protection Council Act 1994</i>	<p>The <i>National Environment Protection Act 1994</i> establishes the National Environment Protection Council (now known as the Environment Protection and Heritage Council). The Council is responsible for developing national environment protection measures (NEPM).</p> <p>The National Environment Protection (National Pollutant Inventory) Measure 1998 requires organisations to report on emissions of certain pollutants.</p>
<b>Queensland Legislation</b>	
<i>State Development and Public Works Organisation Act 1971 (SDPWO Act)</i>	<p>The SDPWO Act has a number of functions in relation to State planning and development including coordination of environmental assessments of significant projects. In relation to coordination of environmental assessments, the SDPWO Act establishes an EIS process for projects declared as Significant Projects under the Act. The Office of the Coordinator-General provides an overall facilitation and coordination process in relation to the setting of Terms of Reference for an EIS, and assessment of an EIS prepared by a proponent. In this role, the Office of the Coordinator General seeks advice from other State government agencies. Where a project is being assessed under the EPBC Act through a bilateral agreement, the Office of the Coordinator General also liaises with SEWPC.</p> <p>Work associated with the Project cannot commence until approval, in the form of a Coordinator-General’s report is granted. Once approval is granted, this EMP will need to be updated to incorporate actions required to achieve compliance with approval conditions.</p>



Title	Relevance to the Activity
<i>Environmental Protection Act 1994 (EP Act)</i>	<p>The EP Act places emphasis on managing Queensland’s environment within the principles of ecologically sustainable development.</p> <p>While concerned with all aspects of ecologically sustainable development, regulations, policies and other requirements under the EP Act focus on protection of air quality, acoustic quality and water quality as well as on waste management and land contamination. Hazardous waste dams are also regulated under the EP Act.</p> <p>The EP Act sets up a process for environmental approval of mining activities on mining leases and other mining tenure established under the <i>Mineral Resources Act 1989</i> (MR Act). Where a project is a Significant Project under the SDPWO Act, the EP Act allows for issue of an environmental authority (mining lease) once approval under the SDPWO Act is obtained.</p> <p>As the regulator for mining activities under the EP Act, EHP participates in the SDPWO Act EIS process, reviewing the EIS against policy and other requirements established under the EP Act, and assisting the Office of the Coordinator General in determining appropriate conditions for the environmental authority.</p> <p>Activities may not commence within the mining lease until an environmental authority is in place, and must then take place in compliance with conditions of the environmental authority.</p> <p>This EMP has been prepared to meet requirements under the EP Act and proposes conditions for an environmental authority (mining lease).</p> <p>This EMP will be updated to incorporate conditions of the environmental authority once the authority is issued.</p> <p>The EP Act also imposes a ‘General Environmental Duty’ requiring all individuals and organisations to take all reasonable and practical measures to avoid environmental harm.</p>
<i>Environmental Protection Regulation 2008 (EP Regulation)</i>	<p>Schedule 2 of the EP Reg lists 64 Environmentally Relevant Activities (ERAs) including waste disposal and sewage treatment. The regulations also provide a regulatory regime for minor issues involving environmental nuisance such as noise.</p>
<i>Environmental Protection (Waste Management) Regulation 2000</i>	<p>The <i>Environmental Protection (Waste Management) Regulation 2000</i>, implements various waste management matters covered by the EP Act.</p>
<i>Environmental Protection (Water) Policy 2009 (EPP Water)</i>	<p>The EPP (Water) establishes environmental values in relation to water resources. The EPP and also sets up frameworks for water quality guidelines and prescribes specific water quality objectives for a number of basins in Queensland.</p>
<i>Environmental Protection (Noise) Policy 2008 (EPP Noise)</i>	<p>The EPP Noise defines environmental values in relation to the acoustic environment and sets acoustic quality objectives.</p>
<i>Environmental Protection (Air) Policy 2008 (EPP Air)</i>	<p>The EPP Air defines environmental values in relation to air quality and sets ambient air quality objectives.</p>

Title	Relevance to the Activity
<i>Waste Reduction and Recycling Act 2011</i>	The legislation establishes a framework for waste management and resource recovery practices in Queensland. The purpose of the new legislation is to promote waste avoidance and reduction and to encourage resource recovery and efficiency.
<i>Sustainable Planning Act 2009 (SP Act)</i>	The SP Act provides a framework for development assessment and approval in Queensland, bringing together requirements of a range of legislation.
<i>Water Act 2000 (Water Act)</i>	<p>The Water Act provides for management and sustainable use of freshwater resources in Queensland, including surface waters and groundwater.</p> <p>The approach to sustainable management of water resources is through the development of a Water Resource Plan (WRP) and Resource Operations Plan (ROP) for each basin. The WRP and ROP set out the rules for allocation and use of water resources.</p>
<i>Nature Conservation Act 1992 (NC Act)</i>	The objective of the NC Act is to conserve nature which is to be achieved by an integrated and comprehensive conservation strategy for the whole of Queensland, involving amongst other things the protection of native wildlife and its habitat.
<i>Nature Conservation (Protected Plants) Conservation Plan 2000</i>	A permit under the NC Act will be required for clearing of all native plants. A permit will also be required if a confirmed breeding place for a native animal is to be disturbed.
<i>Nature Conservation (Wildlife Management) Regulation 2006</i>	<p>The <i>Nature Conservation (Protected Plants) Conservation Plan 2000</i> sets out certain requirements in relation to permits to clear native plants. The <i>Nature Conservation (Wildlife Management) Regulation</i> sets out requirements in relation to permits for tampering with breeding places.</p> <p>A permit is also required for fauna spotters involved in vegetation clearing activities to authorise taking of native animals that may require relocation.</p>