OPTION FEASIBILITY STUDY (OFS)

Snowy 2 Transmission Investment

OFS- 000000001901DB revision 0.0

Option description: 500 kV option – Snowy 2.0 – Wagga – Bannaby – Snowy 2.0 triangle

Ellipse project description:
TRIM file: [TRIM No]

Project reason: Reliability - To meet overall network reliability requirements
Project category: Prescribed - Connection

Approvals

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Date submitted for approval	31 October 2017	

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1. Request

This Option Feasibility Study (OFS) is provided in response to Need/Opportunity Statement and Option Screening Assessment (NOSA) 1901 Rev 0, Option DB – 500 kV Snowy 2.0 – Bannaby, Snowy 2.0 – Wagga and Wagga to Bannaby. The NOSA requests Project Development to undertake a desktop assessment of the works associated with the installation of three new 500 kV single circuit lines and associated substation works.

This report provides a desktop assessment of the works described above, taking into account the cost, timing of activities, environmental issues, risk analysis and practicality of being able to complete the works.

2. Considerations

2.1 Snowy 2.0 to Bannaby single circuit transmission line

2.1.1 Transmission line route

The development of a new 500 kV single circuit line between a newly proposed Snowy Hydro 2.0 switching station and Bannaby substation is shown in Figure 1 below. The proposed line route is approximately 240km in length, utilising a route parallel to the existing routes of lines 64 (Lower Tumut to Upper Tumut), 03 (Lower Tumut to Yass) and 39 (Yass to Sydney West). The proposed alignment was developed via a desktop identification of potential constraints, such as major highways, waterways, large clusters of vegetation and residential receptors. Further work will be required at the Project Development stage in order to refine the route.

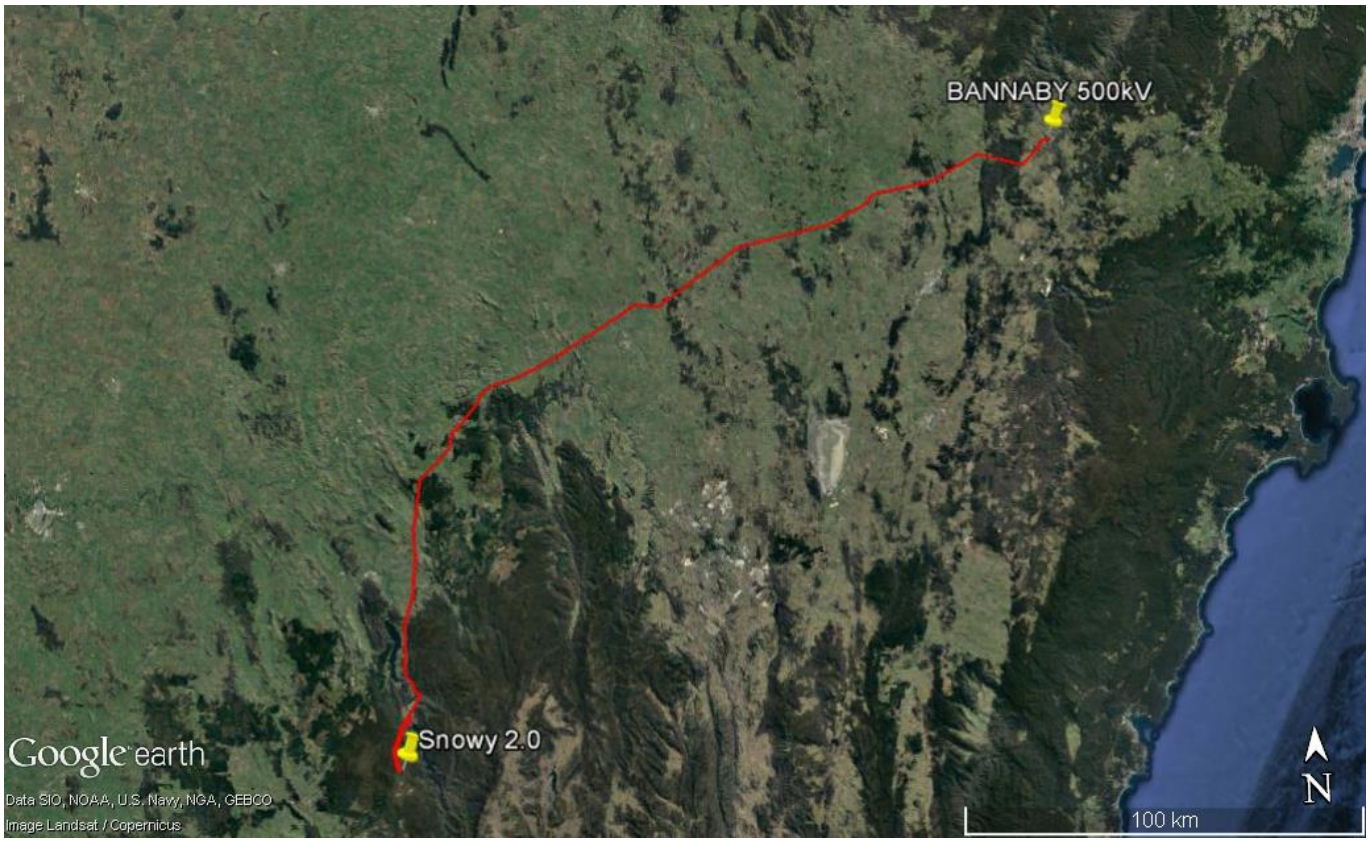

Figure 1 – Snowy 2.0 to Bannaby 500 kV single circuit transmission line

2.1.2 Community and environmental issues

2.1.2.1 Land use

The proposed route utilises both public land and private property. A desktop assessment of the line route indicates the land use being primarily livestock grazing and agricultural, together with a section of the Kosciusko National Park and the Red Hill State Forest. The route avoids the urban centre of Yass, but does pass nearby rural residences.

2.1.2.2 National parks

The current route is initially located parallel to line 64 (Lower Tumut to Upper Tumut) before traversing parallel to lines 03 (Lower Tumut to Yass) and 39 (Yass to Sydney West) within the Kosciusko National Park and Red Hill State Forest. The length of line within these areas is approx. 50km in length.

2.1.2.3 Extent of possible clearing

Standard clearing ratios have been accounted for in the estimate (10, 20, 40, 20, and 10 percent from light to heavy clearing).

A cleared easement parallel to the aforementioned existing lines (i.e. TL 64, 03 and 39) will be required. The actual extent of vegetation clearing will require further investigations during the Project Development phase of the project.

2.1.3 Transmission line design and works

The proposed transmission line is a 500 kV single circuit transmission line with quad orange conductors designed for an operating temperature of 120 degrees Celsius. The transmission line will be equipped with OPGW.

2.1.4 Line connection works at Snowy 2.0 substation

Refer to Section 2.4 “Snowy 2.0 substation works” below.

2.1.5 Line connection works at Wagga substation

Refer to Section 2.5 “Wagga substation works” below.

2.2 Snowy 2.0 to Wagga single circuit transmission line

2.2.1 Transmission line route

The development of a new 500 kV single circuit line between a newly proposed Snowy Hydro 2.0 switching station and Wagga substation is shown in Figure 2 below. The proposed line route is approximately 98km in length, utilising a route parallel to the existing routes of lines 64 (Lower Tumut to Upper Tumut) and 051 (Lower Tumut to Wagga). The proposed alignment was developed via a desktop identification of potential constraints, such as major highways, waterways, large clusters of vegetation and residential receptors. Further work will be required at the Project Development stage in order to refine the route.

Figure 2 – Snowy 2.0 to Wagga 500 kV single circuit transmission line

2.2.2 Community and environmental issues

2.2.2.1 Land use

The proposed route utilises both public land and private property. A desktop assessment of the line route indicates the land use being primarily livestock grazing and agricultural, together with sections of the Bago and Green Hills State Forests. The route avoids the urban centre of Wagga but does pass nearby rural residences.

2.2.2.2 National parks

The current route is located North West of the Kosciusko National Park and traverses parallel to the existing 64 (Lower Tumut to Upper Tumut) and 051 (Lower Tumut to Wagga) through approx. 30km of the Bago and Green Hills State Forests.

2.2.2.3 Extent of possible clearing

Standard clearing ratios have been accounted for in the estimate (10, 20, 40, 20, and 10 percent from light to heavy clearing).

A cleared easement parallel to the aforementioned existing lines (i.e. TL 64 and 051) will be required. The actual extent of vegetation clearing will require further investigations during the Project Development phase of the project.

2.2.3 Transmission line design and works

The proposed transmission line is a 500 kV single circuit transmission line with quad orange conductors designed for an operating temperature of 120 degrees Celsius. The transmission line will be equipped with OPGW.

2.2.4 Line connection works at Wagga substation

Refer to Section 2.5 “Wagga substation works” below.

2.2.5 Line connection works at Bannaby substation

Refer to Section 2.6 “Bannaby substation works” below.

2.3 Wagga to Bannaby single circuit transmission line

2.3.1 Transmission line route

The development of a new 500 kV single circuit line between Wagga and Bannaby substations is shown in Figure 3 below. The proposed line route is approximately 267km in length, utilising a route parallel to the existing route of line 39 (Yass to Sydney West). The proposed alignment was developed via a desktop identification of potential constraints, such as major highways, waterways, large clusters of vegetation and residential receptors. Further work will be required at the Project Development stage in order to refine the route.

Figure 3 – Wagga to Bannaby 500 kV single circuit transmission line

2.3.2 Community and environmental issues

2.3.2.1 Land use

The proposed route utilises both public land and private property. A desktop assessment of the line route indicates the land use being primarily livestock grazing and agricultural uses. The route avoids the urban centres of Yass and Wagga, but does pass nearby rural residences.

2.3.2.2 National parks

The current route contains a greenfield section of approx. 110km from Wagga to near Burrinjuck, before traversing parallel to the existing 39 line (Yass to Sydney West. This route does not pass through any listed National Parks and/or State Forests.

2.3.2.3 Extent of possible clearing

Standard clearing ratios have been accounted for in the estimate (10, 20, 40, 20, and 10 percent from light to heavy clearing).

A cleared easement parallel to the aforementioned existing line (i.e. TL 39) will be required. The actual extent of vegetation clearing will require further investigations during the Project Development phase of the project.

2.3.3 Transmission line design and works

The proposed transmission line is a 500 kV single circuit transmission line with quad orange conductors designed for an operating temperature of 120 degrees Celsius. The transmission line will be equipped with OPGW.

2.3.4 Line connection works at Bannaby substation

Refer to Section 2.6 “Bannaby substation works” below.

2.3.5 Line connection works at Snowy 2.0 substation

Refer to Section 2.4 “Snowy 2.0 substation works” below.

2.4 Snowy 2.0 substation works

The proposed works to establish a new Snowy 2.0 substation include three new 500/330 kV transformer to establish both dual 500 and 330 kV busbar arrangement. Initially there will three new breaker and a half switchbays at 500 and 330 kV, with the third in each being installed with a double breaker arrangement. The new 500 kV line switchbays are for new line terminations to Wagga and Bannaby substations. Whereas the new 330 kV switchbays are to accommodate the line 64 cut-in works.

The proposed Snowy 2.0 500/330 kV substation single line diagram (SLD) is shown in **Error! Reference source not found.**

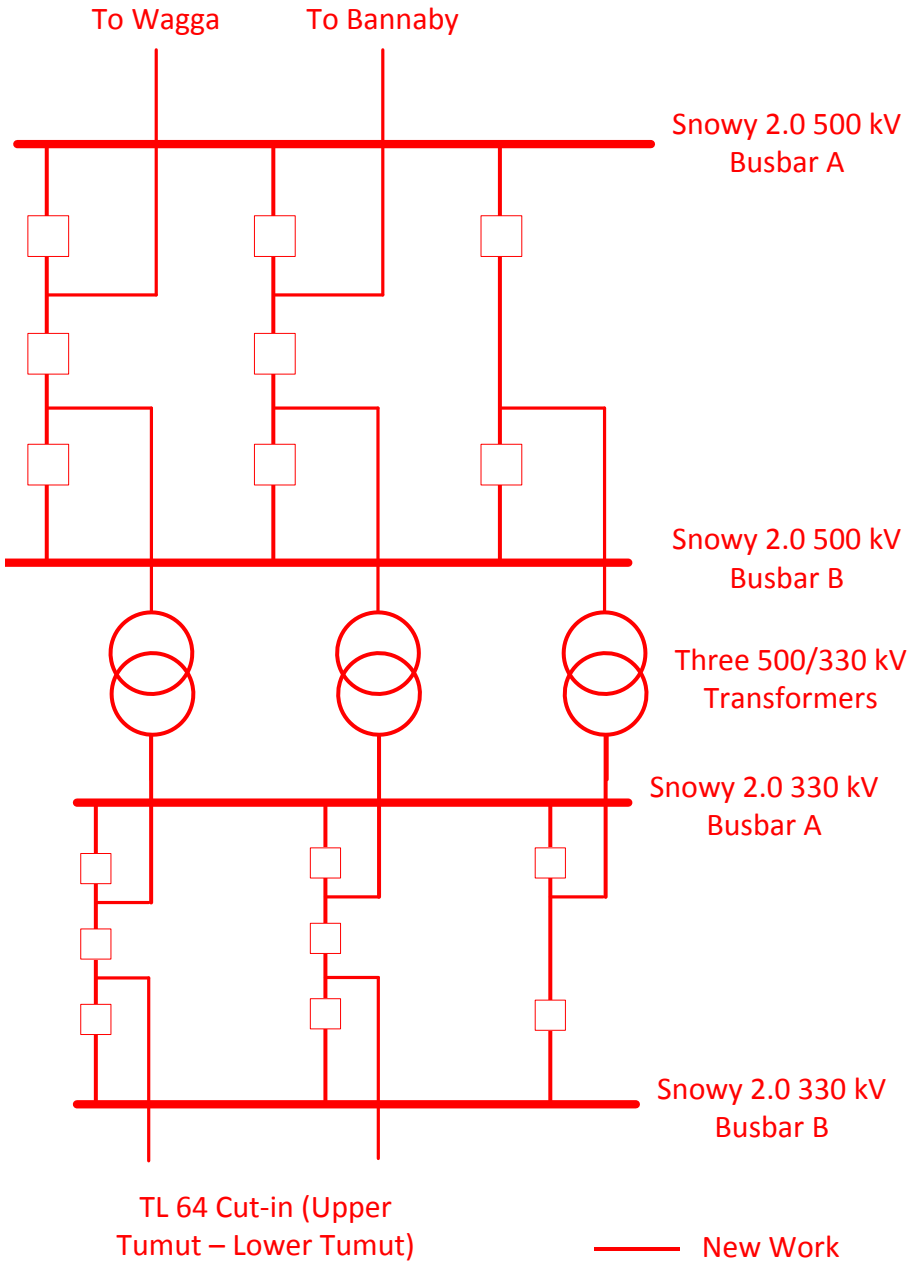

Figure 4 – Snowy 2.0 500/330 kV switchyard and transformers - single line diagram

2.4.1 Property

New property acquisitions are required for the proposed Snowy 2.0 substation works.

Refer to Section 5 “Property considerations” below.

2.4.2 Civil works

Civil works are required for a new substation bench to provide new 500 kV busbars, two new 500 kV switchbays for line terminations, three new 500/330 kV transformers and the associated 500 kV transformer switchbays. A new 330kV switchbay will also be required for the TL 64 cut-in works.

A new access road and access gate is required to access the new site compound for transformer delivery. Access, drainage, oil containment, fencing, cable routes, and footings are required for all new outdoor equipment.

2.4.3 Building works

This study has made allowance for new Secondary Systems Building (SSB) and an Auxiliary Services Building (ASB), in order to house the new secondary systems and amenities required for a new Snowy 2.0 500/330kV substation development.

2.4.4 Major plant and equipment

Three new 500/330 kV transformers.

2.4.5 Minor plant and equipment

All primary and secondary equipment associated with new 500 and 330kV busbar, three new 500 and 330 kV switchbays and associated line 500 and 330 kV line terminations and three new 500 and 330kV transformer switchbays.

2.4.6 Electrical works

Electrical works are required to provide both 500 & 330 kV busbars, 500/330 kV transformer switchbays and 500 & 330 kV switchbays for the respective 500 and 330 kV line terminations.

2.4.7 Secondary systems

2.4.7.1 Protection

Standard protection systems are required for all new substation equipment.

2.4.7.2 Communications

Communications terminal equipment will be installed at the substation end points of each new transmission line. The OPGW associated with the new 500 kV lines between Snowy 2.0 and Wagga and Snowy 2.0 and Bannaby will interface with the proposed terminal equipment.

For the purposed of this study it has been assumed that dual terminal equipment will be installed at the substation end points of each new transmission line in order to provide communication system backup and path diversity.

2.4.7.3 Control systems

Standard control systems are required for the new substation.

2.4.7.4 Auxiliary supplies

An auxiliary system is required that will have sufficient capacity to provide the required auxiliary supplies to all new equipment.

2.5 Wagga substation works

The proposed works to establish a new Wagga 500 kV substation includes one new 500/330 kV transformer to establish a dual 500 kV busbar arrangement. Initially there will two new breaker 500 kV switchbays. The new 500 kV line switchbays are for new line terminations to Snowy 2.0 and Bannaby substations. A new 330 kV transformer switchbay within the existing Wagga 330 kV substation, is to accommodate the 500/330 kV transformer.

The proposed Wagga 500 and 330 kV substations SLD's are shown in **Error! Reference source not found.**

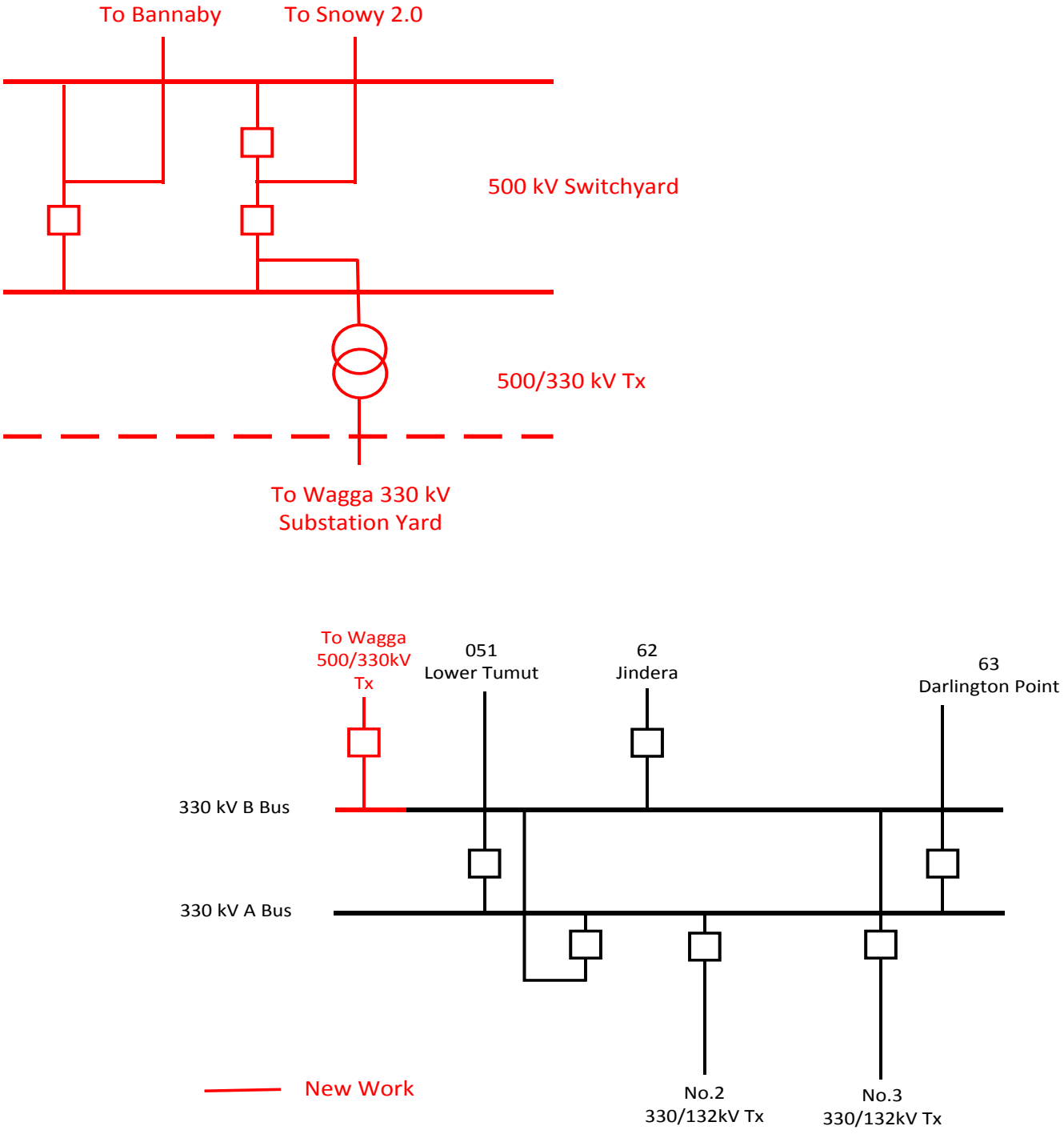

Figure 5 – Wagga 500 and 330 kV substations - single line diagrams

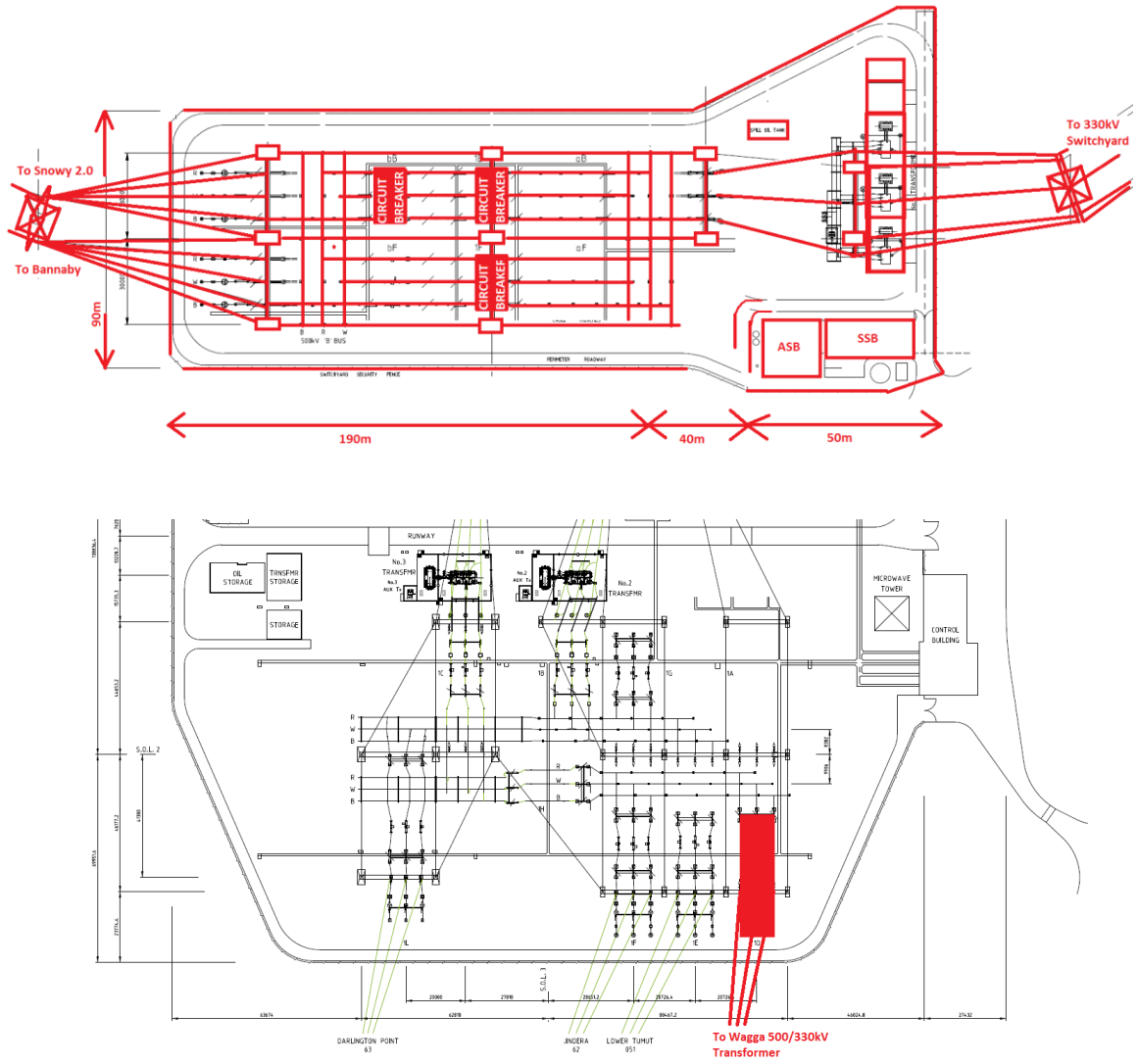

Figure 6 – Wagga 500/330 kV substation – general arrangement

2.5.1 Property

New property acquisitions are required for the proposed Wagga 500 kV substation works.

Refer to Section 5 “Property considerations” below.

2.5.2 Civil works

Civil works are required for a new substation bench to provide new 500 kV busbars, two new 500 kV switchbays for line terminations, one new 500/33 kV transformer and the associated 500 kV transformer switchbays.

A new access road and access gate is required to access the new site compound for transformer delivery. Access, drainage, oil containment, fencing, cable routes, and footings are required for all new outdoor equipment.

Footings for a new 330kV transformer switchbay will also be required within the existing Wagga 330 kV substation.

2.5.3 Building works

This study has made allowance for new Secondary Systems Building (SSB) and an Auxiliary Services Building (ASB), in order to house the new secondary systems and amenities required for a new Wagga 500 kV substation development.

This study also assumes that there is sufficient space available in the existing communications building to house the new secondary systems for the substation 330kV development.

2.5.4 Major plant and equipment

One new 500/330 kV transformer.

2.5.5 Minor plant and equipment

All primary and secondary equipment associated with new 500 and 330kV busbar, three new 500 and 330 kV switchbays and associated line 500 and 330 kV line terminations and three new 500 and 330kV transformer switchbays.

2.5.6 Electrical works

Electrical works are required to provide a new 500 kV busbars, two new 500 switchbays for line terminations, one new 500 kV transformer switchbay and a new 330 kV transformer switchbay within the existing Wagga 300 kV substation.

2.5.7 Secondary systems

2.5.7.1 Protection

Standard protection systems are required for all new substation equipment.

2.5.7.2 Communications

Communications terminal equipment will be installed at the substation end points of each new transmission line. The OPGW associated with the new 500kV lines between Wagga and Snowy 2.0 will interface with the proposed terminal equipment.

For the purposed of this study it has been assumed that dual terminal equipment will be installed at the substation end points of each new transmission line in order to facilitate the requisite communication system backup.

2.5.7.3 Control systems

Standard control systems are required for both the new 500 kV substation and the existing 330 kV substation modifications.

2.5.7.4 Auxiliary supplies

An auxiliary system is required within the new Wagga 500 kV substation that will have sufficient capacity to provide the required auxiliary supplies to all new equipment.

Based on a desktop assessment, it has been assumed that the existing auxiliary systems at the existing Wagga 330 kV substation have sufficient capacity to provide the required auxiliary supplies to all new equipment. Further assessment is required during the Project Development stage to determine whether upgrades to the AC or DC supplies are required.

2.6 Bannaby substation works

This option proposes a bench extension at Bannaby substation for a new breaker and half bays and the installation of an additional circuit breaker in order to accommodate the new line connections to Wagga and Snowy 2.0. A new circuit breaker is also proposed to be installed in the remaining switchbay for an arrangement that operates with three diameters of breaker and a half switchbays.

The proposed Bannaby substation SLD is shown in Figure 7.

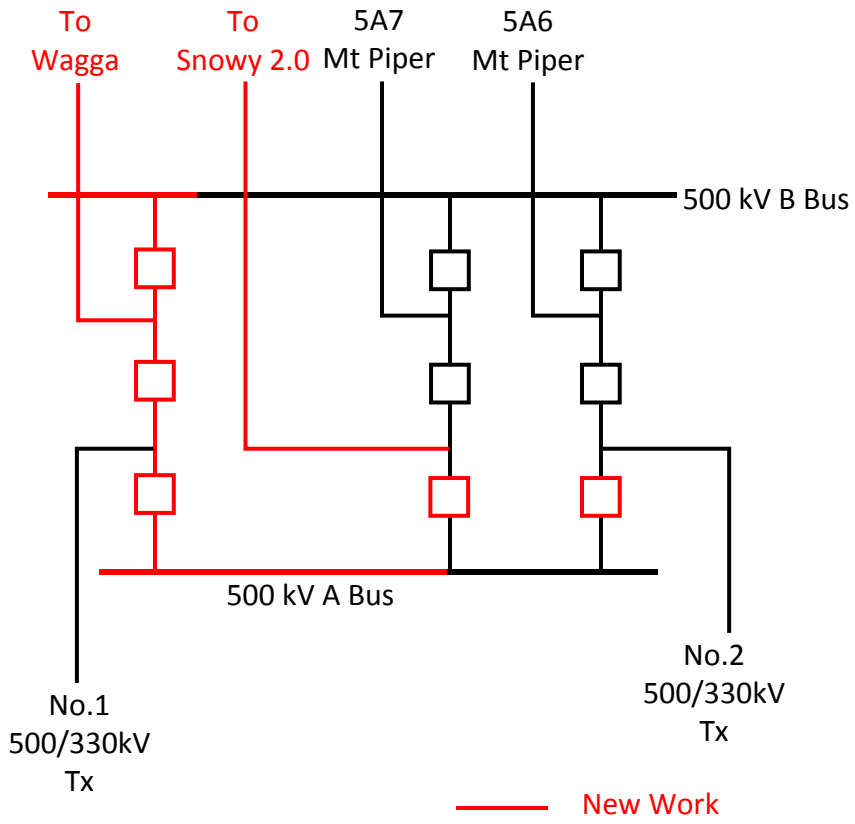

Figure 7 – Bannaby 500 kV substation - single line diagram

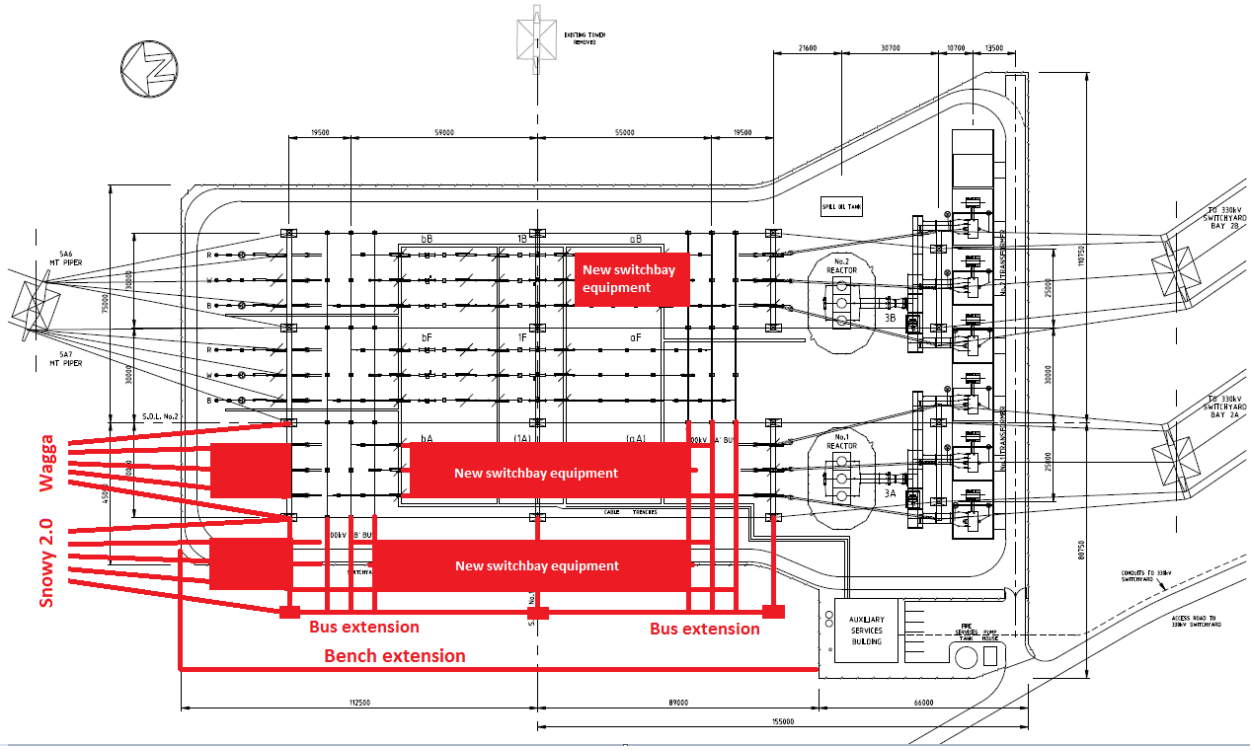

Figure 8 – Bannaby 500 kV substation – general arrangement

2.6.1 Property

No additional property acquisitions are required for the proposed Bannaby substation works.

2.6.2 Civil works

Civil works are required to provide an extension of the existing 500kV busbar, 500 kV switchbays for line terminations. Site access, drainage, fencing, cable routes and equipment footings are required for the extended bench and associated switchbay.

Footings are required for all primary equipment associated with the new busbar extension and 500 kV switchbay works.

2.6.3 Building works

This study assumes that there is sufficient space available in the existing communications building to house the new secondary systems for the substation 500 kV developments.

2.6.4 Major plant and equipment

Nil.

2.6.5 Minor plant and equipment

All primary and secondary equipment associated with new 500 busbar, new 500 kV switchbays and associated line 500 kV line terminations.

2.6.6 Electrical works

Electrical works are required to provide a new 500 kV busbar and new switchbays for line terminations.

2.6.7 Secondary systems

2.6.7.1 Protection

Standard protection systems are required for all new substation equipment, including a new 500 kV bus and associated switchbays.

2.6.7.2 Communications

Communications terminal equipment will be installed at the substation end points of each new transmission line. The OPGW associated with the new 500kV lines between Bannaby, Wagga and Snowy 2.0 will interface with the proposed terminal equipment.

For the purposed of this study it has been assumed that dual terminal equipment will be installed at the substation end points of each new transmission line in order to facilitate the requisite communication system backup.

2.6.7.3 Control systems

Standard control systems are required for all substation modifications, including a new 500 kV bus and associated switchbays.

2.6.7.4 Auxiliary supplies

Based on a desktop assessment, it has been assumed that the existing auxiliary systems have sufficient capacity to provide the required auxiliary supplies to all new equipment. Further assessment is required during the Project Development stage to determine whether upgrades to the AC or DC supplies are required.

3. Outage requirements

The preliminary assessment of outage requirements is as follows.

Equipment	Outage Duration	Recall	Availability	Comment
Wagga 330 kV B Bus	Daily	4 hours	All year (avoid clashes with other local outages)	Required to connect new 500/330 kV transformer switchbay from new Wagga 500 kV switchyard.
Bannaby 500 kV A Bus	Daily	4 hours	All year (avoid clashes with other local outages)	Required to install new Snowy 2.0 and Wagga 500 kV line terminations and associated switchbays.
Bannaby 500 kV B Bus	Daily	4 hours	All year (avoid clashes with other local outages)	Required to install new Snowy 2.0 and Wagga 500 kV line terminations and associated switchbays.
64 Line	Continuous	1 day	All year (avoid clashes with other local outages)	Required to cut-in new Snowy 2.0 500/330 kV substation.

4. Environmental and development approvals

The construction of the new single circuit 500 kV transmission lines has the potential to have a significant impact on both the environment and community.

This project will most likely require an Environmental Impact Study (EIS) in accordance with Director General Requirements and may require ministerial approval.

A more detailed assessment of environmental risk at an early stage of this project should be undertaken as timeframes for approval and potential biodiversity offsetting may be significant. The EIS will need to further consider the alternatives outlined in this study and associated environmental constraints.

Public consultation is a statutory requirement of this process.

5. Property considerations

Purchasing of additional land will be required for both the new Snowy 2.0 substation site and land adjoining the existing substation at Wagga.

This option will require the acquisition of approximately 605km of new 80m wide easements for the entirety of the new transmission line routes.

The proposed transmission line routes run through existing and new sections of vegetation and consequently there are potential timing risks in acquiring the needed easements.

Acquisition will generally be by private treaty but compulsory acquisition will be used where necessary or appropriate, for example, when acquiring public land. It is not anticipated that options will be taken over land prior to purchase.

The cost for purchasing the required substation land and transmission line easements has been included, based on estimates provided by Manager/Property.

6. Cost estimate

6.1 Capital Expenditure

Based on the program provided in section 7, the estimated project capital cost for completing works for the required scope is detailed below:

Item	Unescalated ($m)	Escalated ($m)
Substation works		
– Snowy 2 Substation	129	143.5
– Wagga Substation	48	54
– Bannaby Substation	16	18
– Upper Tumut and Lower Tumut Secondary system work	0.5	0.5
– **Sub-Total**	**193.5**	**216**
TL works		
– Snowy 2 – Bannaby	405	452
– Snowy 2 – Wagga	155	173
– Wagga – Bannaby	401	447
– 64TL cut-in	2.9	3.2
– Wagga 330 – 500 connection	2.2	2.4
– **Sub-Total**	**965**	**1,078**
Total Project P50 Cost	**1,159**	**1,294**

The expected expenditure profile for this project based on standard spending curve distribution is as follows:

	Total Project Base Cost	Year -6	Year -5	Year -4	Year -3	Year -2	Year -1	Year 0
Estimated Cost– non-escalated ($m 2017-18)	1,159	10	16	17	20	284	459	353

Notes:

1. The detailed breakdown provided in the above table is approximate only and is based on the total scope and nature of works included in the option. Individual numbers cannot be used for estimation of other projects or to separately cost components of this estimate.
2. The cost has been estimated from a scope of work determined by a limited review of the project, as detailed in section 2.
3. The values used in the estimate were generally obtained using TransGrid's Estimating Database.
4. The estimate has been prepared on the basis of standard bays and allowances for the works, with adjustments as detailed in this study for the specific option scope.

5. The estimate has a nominal uncertainty of ±25%. There is some risk that final costing may be outside these bounds due to the low level of investigation able to be completed in the time for preparation of this OFS.
6. The following factors have been applied to the estimates:
   - "Transmission Line – 500kV New" for 500kV lines.
   - "Substation – 330kV New" for Bannaby substation modification works, based on the capital value of the construction works.
   - "Substation – 500kV New" for Wagga and Snowy 2 substation works. These factors were also used for 64TL cut-in and 330kV line connection between Wagga 330 and 500kV switchyard which are considered part of the same work scope in determining capital costs.
   - No factors were applied to Upper Tumut and Lower Tumut works which were developed from standard asset replacement estimates.
7. No allowance has been included in the estimate for exchange rate variations.
8. No adjustment for forward escalation has been included in the totals above. Based on forecast commodity escalation, the nominal estimated cost in each year (i.e. the amount in 2018-19 is in forecast $2018-19) is as follows:

	Total Project Budget Cost	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24
Nominal escalated cost ($m)	1,294	10	16	17	21	310	514	406

7. Project and implementation method

7.1 Single circuit transmission lines and associated substation works

The substation and transmission line works are expected to be completed in an estimated 74 months from the initiation of a detailed Option Feasibility Study (OFS), allowing 31 months for completion of Project Development activities and issue of the PAD and 43 months for project completion following issue of the PAD.

The key dates for this program are detailed in the following table:

Milestone	Duration (Months)	End of Month
Issue of Project Development Initiation (PDI)	0	0
Transmission line route identification	6	6
Concept design complete – Substations	4	4
Concept design complete – Transmission line	12	18
Environmental approval	24	30
Detailed design complete – Substations	9	13
Detailed design complete – Transmission line	12	30
Order of Major Plant and Equipment	12	25
Issue PAD (DG2)	1	31
Site Works -		
Prepare specifications	3	34
Call tenders, evaluation and award of contracts	3	37
Possession of site – Substations	3	40
Possession of site – Transmission lines	3	40
Practical completion – Substations		
Bannaby Substation 500 kV Works	12	52
Wagga Substation 500/330 kV Works	18	58
Snowy 2.0 Substation 500/330 kV Works	24	64
Practical completion – Transmission lines		
TL 64 Cut-in Works	3	43
Snowy 2.0 to Wagga 500 kV TL – 98km	12	52
Snowy 2.0 to Bannaby 500 kV TL – 240km	30	70
Bannaby to Wagga 500 kV TL – 267km	33	73
In-service date	1	74

7.2 Project implementation assumptions

The above programs have been based on the standard program templates for a Line – New (EIS) project and Substation – Augmentation project, with the following adjustments:

- All switchyard augmentation works are expected to be completed in parallel with the associated transmission line works program, with work occurring simultaneously at both connecting substations/switching yards.

The timeframes assume the completion of the following steps prior to issue of the PAD:

- Environmental Approval complete;

- Property acquisition has commenced and negotiations are expected to be complete within twelve months. Approval has been given for compulsory acquisition of those properties where negotiated settlements are not deemed possible.

- Transmission Line design has been completed;

- Substation design completed;

- Regulatory Approval processes complete.

For this option the following key risks to the program have been identified:

a) Environmental Approval of the project is subject to the level of community feedback and decisions by the Department of Planning and the Minister. Standard time frames allow for a “typical” process, however, if there is significant opposition to the project delays of up to 12 months could occur. It is likely that this risk could occur and the DG1 funding approval should be issued with sufficient float to allow for this while still meeting the project needs date.

b) Property acquisition is likely to require some level of compulsory acquisition. The timing of this acquisition is subject to both completion of the environmental approval process and approval to progress to the stage of compulsory acquisition. Further delays could be experienced in this process which may delay Possession of Site for parts of the route. This risk is considered unlikely to occur due to the significant float allowed in the program.

c) The nominated construction period is based on a preliminary line route and assessment of terrain and conditions. No geotech or detailed environmental studies have been completed. As a result, the estimated construction period could vary for a number of reasons including, but not limited to:

    1. The final line route may require additional line length,

    2. Non-standard construction methods, piled foundations or alternative access methods may be required;

    3. Significant environmental works may need to be completed depending on the results of EIS processes;

    4. Final approvals may impose restrictions on the way in which the line is constructed.

    It is possible that this risk could occur and the DG1 funding approval should be issued with sufficient float to allow for this while still meeting the project needs date;

d) The project development period is dependent on completion of the Regulatory Approval process. Delays in this approval will impact on project completion.

e) The program makes allowance for normal inclement weather. If periods of abnormal rainfall occur the program will be delayed.

Transmission line works programs are inherently uncertain until such time as detailed studies and community consultation processes are completed. Accordingly it is likely that delays may occur to this project that result in a program that varies from that detailed above.

The program is based on the specific scope included in this report. If this option is combined with other options on the same site, the total project construction time frame will extend by a period that will be dependent on the availability of outages and staging of the total package of works. This should be allowed for when determining the date for issue of the DG1 approval.

The project program and costing is based on the following implementation method:

- Project development including design, environmental assessment, and estimating to be managed by Project Development. Specification, HV plant procurement and contracting managed by Works Delivery and competitive bids being called for the switching station, substation and transmission line works.

- Site construction works completed by contractors.

- Construction supervision, site management, testing and commissioning by Works Delivery.

8. Project delivery risks

The key risks outlined in the table below have been identified and will need to be managed as part of this project. In the event that these risks occur there could be impacts to both project cost and time for completion. These risks should be assessed at all stages of project development and delivery.

Risk	Treatment
Safety Risks	
There are the normal risks associated with working on a construction project or in a live high voltage station.	Ensure that all works are carried out in accordance with TransGrid's Safety Rules and standard policies and procedures. All site works are to be managed using a site specific safety management plan.
There are normal risks associated with the design of substations.	Ensure that all design works are carried out in accordance with TransGrid's standard designs, policies and procedures. Ensure that all design work is carried out in accordance with TransGrid's safety in design processes.
There are risks associated with access to site locations for new transmission line work.	Access to be assessed in Project Development stage to identify issues and resolve save access. Access plans to be developed in detail and included in relevant safety management plans.
Environment Risks	
There are the normal risks associated with the delivery of large capital projects that may impact on the environment.	Conduct an Environmental Assessment of Project in accordance with TransGrid's standard policies and procedures.
Property Risks	
There are the normal risks associated with significant easement acquisition and property acquisition.	Conduct an Environmental Assessment of Project in accordance with TransGrid's standard policies and procedures.
Community Risks	
There are the normal risks associated with the delivery of large capital projects that may impact on local communities.	Implement a Communication Strategy in accordance with TransGrid's standard policies and procedures.
Project Delivery and Program Risks	
There are the normal risks associated with the delivery of capital projects.	Implement TransGrid's standard policies and procedures during all phases of the work.
Program may be delayed if Regulatory Approval has not been completed in time	Ensure that Regulatory Approval is completed in a timely manner.
Program may be delayed if the equipment orders are not placed with sufficient lead time	Ensure that equipment is ordered as early as possible to suit the project program.
Program may be delayed if outages cannot be obtained	Prepare an implementation plan and providing the earliest possible notification of the required outages.
Project may be delayed if appropriate resources are not available	Ensuring that the project is given the appropriate priority.

Risk	Treatment
There is a risk that environmental approval for new transmission line easements that originate from within Kosciusko National Park and the surrounding State Forests (i.e. Bago, Green Hill and Red Hill) will be difficult and require additional environmental offsets.	A detailed assessment of environmental risk at an early stage of this project should be undertaken (as timeframes for approval and potential biodiversity offsetting may be significant). This risk should also be further investigated as part of the Project Development stage of the project, and may result in an increase to both the cost and time estimates detailed in this OFS.

9. Change history

Revision	Approver	Amendments
0	J. Howland	Initial Issue