RISK MANAGEMENT PLAN

DRAFT

Approvals and Reviews

Risk Management Plan	
Project	CopperString 2.0
Client	CuString Pty Ltd
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1. Introduction

1.1 Project Scope

The CopperString 2.0 Project (the Project) is an extra high voltage transmission system intended to connect the North West Power System (NWPS) near Cloncurry and Mount Isa to the Powerlink network and National Electricity Market (NEM) at Woodstock.

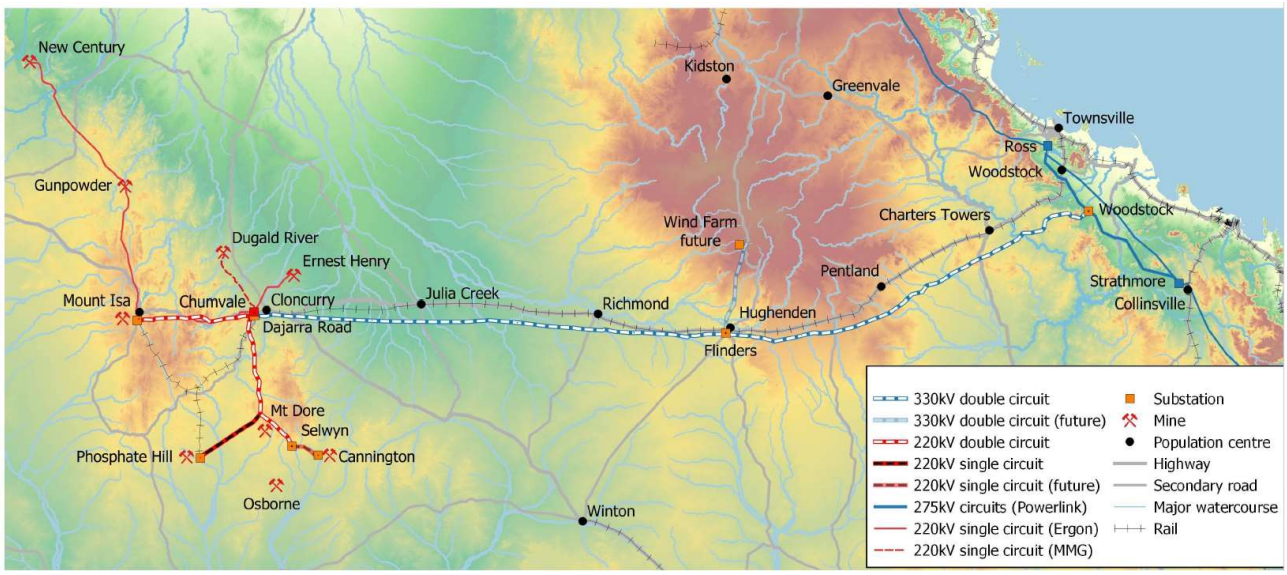


Figure 1: CopperString 2.0 Project – Proposed transmission lines

The purpose of the CopperString 2.0 Project is to connect the North West Minerals Provence (NWMP) to the NEM in order to reduce the cost of power supply and facilitate the large-scale development of the Hughenden wind resource and solar resources within the North Queensland Clean Energy Hub (NQCEH).

The scope of work, traversing East to West, consists of the following sections:

- Powerlink Mulgrave Substation and 275kV line augmentation (Powerlink Connection)
- Woodstock Substation as CopperString connection point to the NEM
- Flinders Substation (Hughenden) as core for Renewable Energy Hub
- Dajarra Road Substation (Cloncurry) as core for distributions to larger load centres
- The primary CopperString transmission backbone
- Southern connections consisting of Phosphate Hill transmission line and Woodya substation for forecasted mining loads
- Northern Mount James transmission line and substation connection for additional renewable generation; and
- Termination via Mount Isa augmentation.

The scope consists of a transmission line between the locations above carrying Extra High Voltage power transmission at 330kV and 220kV respectively. Substations located at the interconnecting junctions above shall distribute power to the NWMP and NQCEH respectively.

1.1.1 Objectives

The objectives of the Risk Management Plan are to:

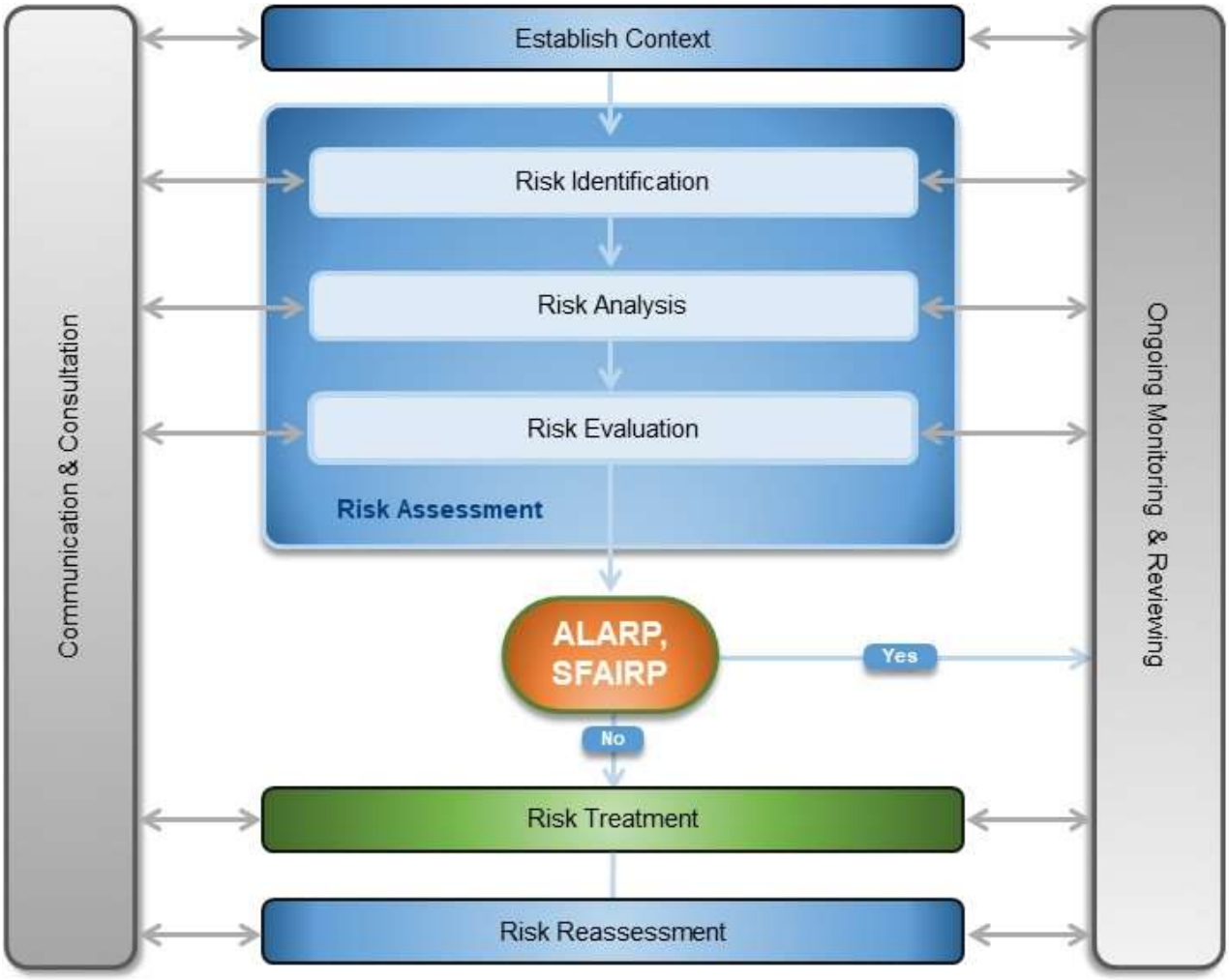
- Ensure that risk management is integrated with every function, discipline and activity on the project
- Ensure that the project team identifies and manages risks and their potential impact on people, the community and other project stakeholders and the environment that may be affected during delivery
- Describe the steps to identify, assess, treat and review risks and their mitigations

- Ensure that information about risks is escalated as quickly as required to allow timely decision making at the appropriate level while being cognisant of the risk likelihood and consequence
- Describe a common structure for categorising and aggregating risks for reporting. Risk will be aggregated project-wide and at activity level
- Support the derivation of strategies to mitigate risks to ALARP (As Low As Reasonably Practical)
- Ensure that relevant stakeholders are involved in decision making in the management of risks related to them
- Develop and maintain project risk registers
- Regularly report on the progress of risk management to ensure full transparency and accountability throughout design, construction, pre-commissioning, commissioning, acceptance and handover.

1.1.2 Process and Framework

The application of a formal risk management process will provide a structured, logical way to identify and assess the project risks and opportunities. Our risk and opportunity management framework (see Figure 1 below) will be developed for the project in line with the framework of AS/NZS ISO 31000:2018.

Figure 1: Risk Management Framework



1.2 Risk Management

1.2.1 Risk Management Process

The risk management processes the UGL CPB JV will implement will be governed by a project-specific Risk Management Plan that complies with AS/NZS ISO 31000:2018 Risk Management – Principles and Guidelines. The plan will be based on similar plans successfully implemented for major infrastructure projects performed by the JV partners. It will detail our risk management strategy, risk framework and risk management system, processes and internal controls to manage project risks. It will also describe the specification, implementation and maintenance of a risk management database. The database will be supported by a risk management software package on a shared platform. This plan will be implemented and updated until Practical Completion.

Note that the project workplace health and safety risks will be comprehensively addressed in the Workplace Health and Safety Management Plan as outlined in the Workplace Health and Safety Management Plan of the Returnable Schedules. Both plans will form part of the suite of interrelated plans in the project management system that together, outline how the project will be managed using an integrated approach to satisfy the requirements of the Deed and meeting Powerlink's requirements.

Table 1 outlines how we will implement. our risk management process to maintain ISO standard compliance.

Table 1: Risk Management Process Implementation

AS/NZS ISO 31000 Principles	Proposed Implementation for Compliance
Risk management creates and protects value	Risks will be assessed against multiple criteria to ensure all elements of value are assessed and addressed.
Risk management is an integral part of all project processes	The risk management process will be applied in every element of the project from tender to planning and design, through construction to pre-commissioning, commissioning, acceptance and handover. It will include all disciplines and activities including safety, environment, people, technical, community and stakeholders, financial, legal, reputation and interfacing. Risk management will be integrated across the project as a whole and at individual activity levels. Risks will be categorised and escalated and aggregated between each level and reported on a regular basis.
Risk management is part of decision making	Risks and opportunities will be regularly updated as the project progresses and presented and discussed in a number of project-level forums to guide decision making. Risk management reporting will also be an agenda item at divisional project review meetings. Interaction with stakeholders will be underpinned by a clear understanding of any associated risks to the project objectives.
Risk management explicitly addresses uncertainty	The fundamental principle is to ensure that concerns are raised and discussed at the earliest opportunity. Potential risks will be recorded in the Risk Register with the status of 'potential' pending the collection of further information. The timeframe for clarifying the risk will be set at the time of its inclusion in the register. The risk owner will be required to assess and quantify the risk and propose a mitigation to be implemented within this period. A follow- up discussion will occur in the following review meeting/workshop or as required, thus keeping the risk under active consideration.
Risk management is systematic, structured and timely	The risk process timeframe will be aligned to project reporting timelines to ensure there is a timely resolution of discrete risks and integration with the project program.
Risk management takes human and cultural factors into account	The risk review process will be iterative and involve reviews by both operational and functional personnel from Powerlink, the project team and key stakeholders as appropriate, to ensure that all perspectives are understood.

	This process aims to minimise bias and also recognise the perception and human factors inherent in decision making.
Risk management is transparent and inclusive	The risk process will be transparent, and both 'top down' (in identifying key risk areas) and 'bottom up' (key risk events identified by the various operational teams), thus ensuring an inclusive approach to risk management at all levels.
Risk management is dynamic, iterative and responsive to change	The Risk Register will be reviewed and updated as often as circumstances demand (at least monthly). It will remain a live document.
Risk management facilitates continual improvement	The plan will be updated no less than six-monthly. This will act as a catalyst to consider process improvements to the risk management process. This review process will also provide an opportunity to import lessons learned through benchmarking the project against other similar projects being undertaken by UPL and CPB.

1.2.1.1 Context

It is important that our risk management process is aligned with the objectives of the Project. This is the context in which risk management will be conducted. Risks will manifest across numerous areas which will need to be considered when evaluating and implementing mitigations, including:

- Asset management – construction plant and equipment
- General management
- Compliance – products and services / contract delivery
- Personnel
- Financial
- Stakeholders
- Environmental
- Technology
- Reputation.

1.3 Risk Assessment

1.3.1 Identify Risk

We will follow a structured process for identifying all the risks and opportunities that may impact the achievement of the Project's objectives and document them in a comprehensive Risk Register. This is a project-specific database identifies risks and opportunities, their timing and their likely consequence for the project program and cost, with the results of the risk and opportunity assessment process and supporting discussions. The register will provide a basis for management review of project risks and opportunities and documenting proposed action plans to be used to manage risks and opportunities. It will be our basis for monitoring the progress of risk and opportunity treatment actions. We will use our proprietary software package, which has the facility to report through all categories and levels.

This process will provide a clear and concise representation of the potential risk exposure of the project through its lifecycle, including all applicable stages, phases and transitions between phases and adjusting the causes and likely impacts as necessary. In addition to discipline focused risk and opportunity workshops performed during tender stage, a range of other forums will be deployed post award to identify risks and raise the level of awareness in the project team and stakeholders. These forums will include as a minimum, Safety in Design workshops, Constructability Workshops, Safe Work Method Statement (SWMS) meetings and Toolbox meetings.

1.3.2 Risk Analysis and Evaluation

The goal of risk assessment is to capture judgmental perceptions of risk in a structured way to obtain the most objective assessment possible. The structured assessment of risk will range from advanced analytical

techniques during design e.g. fire and whole of life analysis, flood studies, to qualitative discussions by the risk owners and work crews in preparing SWMS. In conducting a risk analysis and evaluation, the risk owner must:

- Examine and analyse each identified risk, including the nature of the risk, the likelihood of it occurring, the consequences should it be realised and the range of control measures available to eliminate or minimise it
- Consider risks cumulatively as well as individually
- Use methodologies that are appropriate to the risk being considered.

Each risk and opportunity will be analysed qualitatively and/or quantitatively. The former will entail a descriptive review to better understand the causes and effects and to establish a ranking of risks and opportunities. The latter will capture specific values for the likelihood of the risk or opportunity occurring and the assessment of the impact consequences in financial, schedule, safety environmental and reputational terms.

1.3.3 Risk Treatment

Having identified and assessed the risks, the risk owners will determine whether existing control mechanisms can contain any risks below ALARP or SFAIRP as applicable or if treatment is required. They will do this by referring to the project Risk Assessment Matrix to evaluate risks for likelihood, consequence and severity.

All risks whose severity is ranked highly at a certain threshold level and/or that have potentially catastrophic consequences, will have a dedicated treatment developed to proactively mitigate the risk. Incorporating regular review, the allocated risk owners will be responsible for ensuring that the treatment actions identified are performed in a timely and effective manner as prescribed on the Risk Register.

1.3.4 Risk Reassessment

The known risks captured in the project Risk Register will be regularly reviewed by the risk owners and the results communicated to the Project Manager who will update the Joint Venture Steering Committee. The Risk Register will also be reviewed in response to:

- Changes in project scope, conditions, circumstances, planning or legal requirements
- Preparation for planned change in focus of activities (e.g. transition into procurement, delivery, construction, pre-commissioning and commissioning)
- Planning and preparation for a major activity
- A need to assess specific subcontractor and supplier performance risks
- Unexpected outcomes in project execution
- Findings of inspections, audits and management reviews.

1.3.4.1 Certifications the Tenderer holds

The CPB UGL JV parties implement risk management in accordance with AS/NZS ISO 31000:2018, which cannot be used for certification purposes but does provide guidance for internal or external audit programs. However, both UGL and CPB hold current certifications to the standards identified in Table 2 below which contain risk management processes.

Table 2: UGL and CPB Certifications with a Risk Management Component

Certification Standard	Cross-reference to Risk Management within Standard
AS/NZS/ISO45001:2018 Occupational Health and Safety Management Plan	Risk is emphasised and woven in throughout this standard. The standard requires organisations to identify workplace hazards and address risks associated with their operations, processes and activities aimed at and resulting in improved OH&S performance. The standard also expects organisations to address opportunities for improvement and take corrective actions based on risk.
AS/NZS 4801:2001 Occupational Health and Safety Management Systems	(Now superseded by AS/NSZ/ISO 45001:2018) This standard requires organisations to establish, implement and maintain documented procedures for

	hazard identification, hazard/risk assessment and control of hazards/risks for activities, products and services over which they have control or influence.
AS/NZS/ISO 14001:2015 Environmental Management Systems	Embraces a strategic risk management process with senior management buy-in to ensure that a proactive, measured and strategic response is taken towards environmental concerns. This is reinforced by audits and a management review process. The key benefits to the environment are available from a major bias toward identification and prevention of incidents rather than reactions to events.
AS/NZS/ISO 9001:2015 Quality Management Systems Requirements	Requires organisations to establish an end-to-end process for risk management and then to execute that process consistently, carefully and widely. It requires identification, assessment and communication of risks throughout project delivery and implementation and management of actions to mitigate the risks.

1.3.5 Risk Management Strategy

Our risk management strategy on the project will be to:

- Ensure that risk is reduced to ALARP (As Low As Reasonably Practicable) or lower, by applying a systematic process
- Establish and maintain a strong and sustained commitment from the Project Director to ensure that the necessary skilled resources are allocated to risk management
- Integrate risk management seamlessly with all project disciplines and functions including those relating to health and safety, design, environment, community and stakeholders, quality, construction, project pre-commissioning, commissioning, acceptance and handover
- Establish and maintain a ‘risk aware’ culture within the project team, and our subcontractors and suppliers.

1.4 Risk Register

The CopperString 2.0 project risk register is included within Appendix A – Risk Register for reference.

Appendix A Risk Register

Total Risks	**403**	**R&O Value**	**$43,890,575**	Requiring further update to finalise	Comment included
Risks > 8	**47**			Amendment since 27/05/2021 update	

403 $43,890,575 47

Item	R or O	Location	Risk Name	Details of risk event	Consequences of the risk event	Treatment of Risk/Mitigation Strategies	Likely ($)	Cost Value	Description	Likely (%)	Likihood	Value of Cost
ENG-22	Risk	All works	Country of procurement for quality control	Country of origin for procurement items may impact quality. Quality control of equipment procured internationally, particularly, China, may not meet the standards/quality as prescribed. e.g. galvanised towers, primary plant Changes to steel mix	Impacts include: - Delays to material supply - Quality assurance issues - Inconsistencies in production	Treatments include: - Equipment procurement from pre-approved Powerlink suppliers - QA audits of new suppliers including factory visits by UGL personnel or UGL representatives - Engineering review of all supplier ITPs, certificates etc	$7,510,000	***$375,500,000***	Substation Cost	10%	20%	2.0%
ENG-08	Risk	All works	Designer Resourcing - Design Growth	Increased design effort required due to: - changes in equipment configuration - additional detailing requirements - additional specification detailing - additional drafting	Impacts include: - Increased design costs - Increase in project durations - Increased requirement for manning	Treatments include: - Engagement of an experienced Design Managers who fully understands the design constraints, design sequencing and timing requirements - Design leads and teams to understand basis of the estimate and design to the estimate - Identify critical packages (e.g. foundation concrete, foundation steel, earthworks cut/fill, tower steel mass) to be tracked through the design process and reviewed against estimate at each design review - Designers to continue to develop cost saving alternatives (either in materials quantities or time related savings) where possible to reduce growth - Design Manager and Design Leads to follow	$1,487,407	***$39,142,289***	Substation Cost	10%	38%	3.8%
SS-55	Risk	All Sub-Stations	Damage of equipment in transport	Damage caused by inappropriate handling of equipment during transport (Plant & Logistics register)	Rework and delay	Treatments include: - JV strictly follow QA procedure for packing and transport of equipment - engage experienced transport company to handle overseas and local transport	$2,446,773	***$244,677,303***	Substation Equipment	20%	5%	1.0%
ENG-33	Risk	All works	Tower design for constructability due to access constraints	Due to access limitations, other than standard tower construction methods may be required (i.e. helicopter).	Impacts include: - Standard tower designs cannot be erected - Design re-work - Construction delays	Treatments include: - Review of line route and available terrain data for tower sites with potential access issues - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design - Constructability input to be incorporated into design including any requirement for helicopter erection, limitations of crane sizes etc.. - Develop construction management plan that considers the above access and impacts to material sources, construction access, transportation, etc.	$3,435,000	***$687,000,000***	Transmission Line Cost	5%	10%	0.5%
HRIR-09	Risk	All works	Uncertainty over EA negotiation outcomes	Assumptions for labour costs in the tender differ from the final EA outcomes including wage rates, productivity allowance, other allowances, escalation, etc	Impacts include: - additional costs for labour	Treatments include: - CPB and UGL will utilise experienced internal IR expertise for EA negotiations - bid allowances for EA rates are set higher than current CPB and UGL agreements to reflect anticipated "hot" market.	$2,139,521	***$285,269,530***	Labour Blue Collar & White Collar	15%	5%	0.8%
CIV-13	Risk	All Lines	Skipping of tower locations	Work front is programmed to progress from Cloncurry east and Townsville west to get through the 1st wet season before commencing in the black soil area. Program is sequenced on a lineal workfront cannot as per plan.	Concrete required to be catered from plants with higher travel times. Concrete quality issues	-Concrete mix design trials with admixture for longer slump retention. Volumetric mixers to be included in the mobile plant fleet. -Input is LiDAR and CH surveys Assumption is JV will peg and maintain CH areas with CH Survey buy Cu	$2,061,000	***$687,000,000***	Transmission Line Cost	1%	30%	0.3%
CIV-72	Risk	All Lines	Retention of site resources	Wages turnover could be potentially high reducing quality increasing staffing training costs.	Lack of job knowledge, increased inductions, increased training requirements, inferior quality, lack of continuity	Treatments include: - implementation of robust EBA scheme - early recruitment of key staff positions - introduction of bonus scheme based on completing the project / time served	$1,657,550	***$165,754,975***	Blue Collar Costs	5%	20%	1.0%
HRIR-30	Risk	All works	Competent Stringing Labour	Due to the market being overheated a portion of the labour may not meet the required standard	Can cause HSE incidents. Increased union activity. Schedule slip	Treatments include: - Supervisors and management of site actively involved in recruitment process and reviewing of candidates - Consider training and upskilling where a gap have been identified	$1,633,484	***$36,299,652***	Labour Stringing (OPGW & Conductor)	10%	45%	4.5%
CIV-29	Risk	All Lines	Performance of piling subcontractor/s	Risk that piling subcontractors do not perform the works in accordance with program requirements. Under resourced, poor management.	- Delays to project - Cost overrun	- Award contract to multiple piling contractors to maintain competition and motivation between crews - Select experienced subcontractors who are experienced working on transmission line projects in rural settings.	$1,492,060	***$149,205,952***	TL Foundations	5%	20%	1.0%
CIV-81	Risk	All Lines	Securing consents / approvals / third party agreements / land purchase /way leaves / permanent easements	JV fail to obtain prior to the works being required i.e. Main Roads, QR, Ergon, Councils, DRNM (waterway barriers)	Diversion of services, re-siting of assets, delay to programme, inability to meet contractual requirements.	Treatments include: - ensure that JV are responsible to identify and lodge submission approvals in a timely manner for the provision of consents / approvals for construction stage	$1,140,000	***$1,900,000,000***	Project Cost (CV)	2%	3.0%	0.1%
HRIR-31	Risk	All works	Competent Supervision of Labour	Due to the market being overheated the level of experienced Supervision may vary, some being entry level or not at the required level.	Can cause HSE incidents. Increased union activity. Schedule slip	Treatments include: - Focus on filling Supervision roles with key known JV resources who can instil the CPB/UGL values - Ensuring appropriate training and continuing development of all Supervisors. - CPB/UGL to conduct mandatory training for all Supervision within project to ensure consistent compliance with HSE and HR Management Plans	$994,530	***$165,754,975***	Blue Collar Costs	3%	20%	0.6%
CIV-130	Risk	All Lines	UXO investigation	Based on UXO pricing, OPEC provided a price of $2.5M. Milsearch another military recommended UXO investigator provided a desktop price of $600k but would not commit until they viewed the site	Cost overrun for UXO surveys	Once access is provided, provide Milsearch with access to site to be able to accurately price	$950,000	***$1,900,000***	UXO Survey Delta	100%	50%	50.0%
SS-12	Risk	All Sub-Stations	Long lead time items	Creeping times for major plant and equipment caused by supplier reliability	Delays to programme to replace, repair, re-order	Treatments include: - instigate early procurement during the early works stage - complete all technical queries early with Powerlink and suppliers (workshop?) - complete all T&C's early with Powerlink / supplier	$914,032	***$304,677,282***	Primary Plant & Equipment	10%	3%	0.3%
ENG-11	Risk	All works	Substation equipment changes	Design Growth - Transformer and other substation plant and equipment qtys vary due to: - finalisation of design - tender omissions - CuS disagreements/ interpretations - design life considerations - customer interface requirements - operational environmental requirements	Impacts include: - Increased design costs - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Engagement of an experienced Design Managers who fully understands the design constraints, design sequencing and timing requirements - Design leads and teams to understand the basis of the estimate and design to the estimate - Identify critical packages (e.g. foundation concrete, foundation steel, earthworks cut/fill, tower steel mass) to be tracked through the design process and reviewed against estimate at each design review - Designers to continue to develop cost saving alternatives (either in materials quantities or time related savings) where possible to reduce growth - Design Manager and Design Leads to follow Change Management Process when change occurs	$0	***$244,677,303***	Substation (Primary & Secondary) Equipment	5%	0%	0.0%
HRIR-15	Risk	All works	Lost time due to industrial action or safety event	Work on project interrupted due to: - Site related industrial issues - Working / travel conditions - State or national stoppages - Serious injury occurs - Other safety issue e.g. lifting or EWP incident	Impacts include: - Lost time and resultant program delays	Treatments include: - implementation of various project plans to manage these risks - allowance of program contingency	$828,775	***$165,754,975***	Blue Collar Costs	5%	10%	0.5%
TL-10	Risk	All Lines	Productivity assumptions	Productivity assumptions in base estimate are incorrect e.g. availability of skilled workforce (rigging and working at heights), learning curve issues, travel time camp to site, crew sizes, crew transport vehicles etc.	Impacts include: - cost overrun	Treatments include: - benchmarking used in estimate - daily monitoring of productivity rates on site - daily monitoring of manpower/P&E on site - regular monitoring of earned value - allowance of $ in R&O - allowance of contingency in program	$828,775	***$165,754,975***	Blue Collar Costs	5%	10%	0.5%
ENG-14	Risk	All Lines	TXL tower steel growth	Transmission Line Tower steel mass varies due to: - changes in steel grade / specification due to sourcing from India rather than China. - final detailing - member sizes	Impacts include: - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Engagement of an experienced Design Manager who fully understands the design constraints, design sequencing and timing requirements - Design leads and teams to understand the basis of the estimate and design to the estimate - Selection of transmission tower steel fabricator to be made with understanding of grading impact - Tower steel mass / grade / specification / member sizing to be tracked through the design process and reviewed against estimate at each design review - Designers to continue to develop cost saving alternatives (either in materials quantities or time related savings) where possible to reduce growth - Design Manager and Design Leads to follow Change Management Process when change occurs	$4,000,000	***$16,000,000***	Transmission Line Materials	25%	100%	25.0%
ENG-17	Risk	All Lines	TXL route change	Total number of towers changes due to: - more angles, bends due to terrain and other constrained areas - spans - transpositions - foundations across different terrain types - avoidance of unexpected features (e.g. CH, rocks, other constrained zones) - changes due to emerging data after EPC submission. Risk arises from change in tower position after the ECI is complete and EPC price submitted	Impacts include: - Additional tension towers in lieu of suspension towers - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Review the map layers on CuS GIS system and assess the crossings data, other no go zones such as CH, protected vegetation, etc. - Construction team to audit/carry out site/route survey based on preliminary tower spotting and feed back any information to design - Design of new towers and spans with sufficient margin to allow micrositing	$824,400	***$687,000,000***	Transmission Line Cost	3%	4%	0.1%
CIV-80	Risk	All Lines	Supply chain issues for Substations and Transmission Line	Supply chain issues caused by: (i) limited resources in marketplace (ii) faulty material (iii) liquidation of sub-suppliers (iv) poor performance	Late issue of products, poor quality, delays caused by replacement parts being required	Treatments include: - additional product / spares - robust post delivery QA - supplier onsite during installation and post to sign off QA	$800,833	***$800,832,655***	TL & Substation Primary Equipment	20%	0.5%	0.1%
ENG-38	Risk	All works	Energisation and handover	JV philosophy is currently based on multiple handover. Due to cut in complexities at WDS or MIS, one staged approach might not meet other stakeholder requirements. Multiple staged handovers may be required.	Impacts include: - Design changes/rework - Additional staging design - Increased construction works - Extended energisation and commissioning requirements	Treatments include: - PPR and DoR to clearly articulate handover obligations/responsibilities - Design leads to understand the proposed energisation/handover scope and design accordingly - Follow Change Management Process where change occurs	$782,563	***$9,782,037***	Commissioning Labour	20%	40%	8.0%
HRIR-26	Risk	All works	Recruitment	Difficulty in recruiting staff and labour due to competing projects such as HumeLink, Project EnergyConnect and QNI. This risk applies to all disciplines including design, construction, commissioning and admin.	Impacts include: - Pay costs for attracting staff and workers from overseas - Pay higher salary/wages to attract staff/labour - Recruitment & onboarding costs for replacement labour including inductions - cost for delay & standby - poor quality work from 2nd grade workers - loss of reputation	Treatments include: - good recruitment planning, commencing before award to secure staff and workers on expectation we will win and execute substantial transmission line works over the next 5-10 years - establish linesmen training facilities in source countries e.g. Philippines - attractive remuneration & conditions - succession planning - selective use of subcontractors - advertise to improve branding and attractiveness project and JV partners - retention bonus schemes for staff - recruit early (now) before requirement becomes crucial	$713,174	***$285,269,530***	Labour Blue Collar & White Collar	5%	5%	0.3%

CIV-62	Risk	Substations	Site security - theft and vandalism	Loss or damage to plant equipment and / or materials, caused by expensive 'target' plant e.g. syncon, transformers and other HV equipment on site.	Loss of essential items causing programme delay. High value items such as these will generally have an extremely long lead time if repair and / or re-order is required	Treatments include: - additional security guards (24/7) in some locations - addition of cameras / security systems (monitored) - storage of equipment off site, delivered JIT, as required only	$700,777	***$175,194,267***	Substation Primary Plant	2%	20%	0.4%
CIV-08	Risk	All Lines	Shortage of construction water for dust control & earthworks and batch plants	Insufficient water available to supply the needs of access track construction, maintenance and **dust control** . Unable to obtain water licences. Under the EIS no new bore's to be installed. Insufficient (including poor quality water not meeting specifications for concrete mix design) water available to supply the needs of concrete batching plants	Impacts include: - cost overrun - delay costs	Treatments include: - investigate availability of sufficient suitable free standing water at proposed locations of batch plants at time of tender - in the absence of free standing water, investigate availability of bore water and required license to use at proposed locations of batch plant - location of rivers	$552,285	***$4,909,203***	Construction Water	25%	45%	11.3%
CIV-30	Risk	All Lines	Claims and variations from piling subcontractor/s	Claims and variations from piling subcontractor/s. Failure of JV to provide timely access, free issue concrete and rebar, working platforms.	- Delays to project - Cost overrun	-Provide clear program dates to preceding clearing and platform subcontractors to establish accountability. -Sequence works to include fallback areas - Do start work crews too close to each other resulting in additional unnecessary mobilisations. - Installation of dedicated mobile batch plants along alignment will ensure at these locations that concrete is not diverted away from the project to service local customers.	$521,775	***$69,570,000***	TL Pilling Subcontract + Batch Plant	15%	5%	0.8%
HRIR-40	Risk	All works	Fatigue management	Issues arise due to worker fatigue as a result of 21 day roster, long working days, heat, etc.	Impacts include: - Lower productivity - Workplace accidents - Traffic accidents	Treatments include: '- reduce/ manage daily work hours and rest breaks (>10 hours camp to camp). - the second Sunday during a 21 day on roster will be a rest day off work - extended Xmas shutdown - extra water bottles, vests, task assignments	$506,176	***$48,207,204***	21/7 Labour Cost	3%	35%	1.1%
FIN-01	Risk	All works	COVID-19	Covid-19 diagnosis shuts down part or all of State of QLD, shutting down part or all of the projects operations.	Lost productivity, cost over runs as a result of increased accommodation and travel costs as staff enter hotel quarantine, flight cancellations etc.	- Works will occur within the state of Queensland - anticipated by commencement of construction in 2022, the majority of the Australian population will have a CIVID 19 vaccine	$497,265	***$165,754,975***	Blue Collar Costs	10%	3%	0.3%
ENG-16	Risk	All Lines	Services relocation	Requirements for services relocations unknown at ECI stage	Impacts include: - Increased design costs - Additional stakeholder consultation - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Review the map layers on CuS GIS system and assess the crossings data - Liaise directly with Ergon and other asset owners for information - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design	$447,618	***$149,205,952***	TL Foundations& Substation Foundations	10%	3%	0.3%
COM-11	Risk	All works	Insurance - Uninsured losses (Construction / Equipment etc., Permanent Works)	General uninsured losses arising out of damage to hired plant & equipment, vehicles, vandalism etc.	Payment of full rectification costs / repair of damage.	Allowances for rectification of incidents of minor property damage:	$400,000	***$400,000***	Insurance Excess	100%	100%	100.0%
CIV-23	Risk	All Lines	Site Conditions - dewatering groundwater	JV encounters groundwater during excavation of foundations.	Impacts include: - cost of redesign/avoidance - additional construction cost for alternative foundations	Treatments include: - understand prevailing geology of sites to determine likelihood of groundwater and perform targeted Geotech - design to avoid or to deal with it - make inquiries of landowners for location of any springs - design to avoid or to deal with it - negotiate with landowners for alternative access and/or to leave tracks and platforms in situ.	$373,015	***$149,205,952***	TL Foundations	5%	5%	0.3%
CIV-17	Risk	All Lines	Bushfires - externally caused	Damage to JV assets or assets for which JV is responsible or loss of life due to uncontrolled bush or grass fires not caused by JV	Impacts include: - cost for delay - cost of replacement and remedial works	Treatment includes: - prepare and implement an effective Wildfire (Bushfire) Management Plan along with SWMS - establish emergency contacts and download RFS 'Fires Near Me' app - where practicable, establish fire breaks around site boundaries and maintain regularly - regularly remove combustible rubbish from site e.g. packing crates and packaging - have appropriate fire fighting equipment available - implement effective staff training - establish regular monitoring & audit regime - establish effective insurance	$333,467	***$8,336,684***	Construction P&E	10%	40%	4.0%
HRIR-16	Risk	All works	Travel time allowances/ productivity impacts	Travel time allowances from camp to workplace are exceeded due to quality of access roads, speed restrictions, personnel transport logistics, wildlife, etc	Impacts include: - cost of unproductive time - traffic accident impacting wildlife - fatigue	Treatment includes: - optimise camp locations - strong focus on access track suitability and maintenance - establish a fleet of buses and other personnel transport options - use buses driven by qualified drivers - include realistic allowances for travel time in the bid	$331,510	***$165,754,975***	Blue Collar Costs	2%	10%	0.2%
CIV-07	Risk	All Lines	Shortage of quarry materials for substation benches	Insufficient quarry materials available for formation of line access tracks and substation benches and at proposed locations of concrete batching plants	Cost overrun for cartage of material, particularly between Cloncurry and Hughenden through floodplain region.	Treatments include: - optimise location of source of quarry materials with proposed batching plants at time of tender - establish local quarry if rock is suitable from cut material - determine at time of tender, whether CuString's EIS covers quarries and at what locations - Consider alternative methods of soil stabilisation to avoid quarry materials in sections with limited quarry supply	$326,536	***$32,653,625***	Quarry Materials	10%	10.0%	1.0%
COM-12	Risk	All works	Insolvency of key subcontractors	Sub-Contractor goes into liquidation.	Subcontractor unable to perform the remaining works. Subcontractor unable to provide warranties / fulfil contractual obligations.	Thorough review of subcontractor financial stability. Review of company performance at regular intervals throughout the project.	$303,350	***$606,700,000***	Subcontractor	25%	0.2%	0.1%
SS-34	Risk	All Sub-Stations	Specialist equipment and resources	Availability at the appropriate time due to damage / loss / use on other projects: (i) test equipment (ii) winches (iii) commissioning engineers / testers (iv) HV test equipment	Delay to pre-commissioning activities resulting in outages being missed and / or extended (increase risk rating due to competing projects)	Treatments include: - allocate resources and equipment early - store equipment on site where required - ensure that there are contingencies built in with resources and available equipment - prioritise project utilisation and timing for availability	$250,101	***$8,336,684***	Construction P&E	15%	20%	3.0%
SS-84	Risk/ Opp	All Sub-Stations	Subcontractor performance	Subcontractor has poor safety performance	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - manage with regular supervision (using SWMS's as a basis) - employ competent subcontractors with a known history of excellent safety performance	$242,680	***$606,700,000***	Subcontractor	2%	2%	0.0%
CIV-66	Risk	All Lines	Landowner agreements	Agreements with local planning authority / locals / stakeholders prior to site establishment being inadequate or incomplete required by JV. Temporary land use.	Delay to build / installation activities resulting in additional consultation with stakeholders, construction cost of temporary works	Treatments include: - commence stakeholder engagement early / now - ensure use of robust and compliant stakeholder engagement (buy in) with the proposed programme of works including SOW and durations (accurate)	$206,100	***$687,000,000***	Transmission Line Cost	10%	0.3%	0.0%
COM-04	Risk	All works	Variation payment delays	Variations not agreed and costs incurred to recover monies owed post PA.	Late approval of claims. Negative impact on project cash-flow. Interest charges incurred.	Contract sets out payment terms (Refer Deed clause xx) to certify progress payment, paid x days from issue of certificate, max duration between claim and payment of xx Business days (except for disputed amounts). Variations to be submitted and agreed as project proceeds. Maintain sufficient cash reserves in project to cover underclaim. Request up-front payment. 'Consider variations to the value of $7.5m (0.5% of CV) remain unapproved at project completion. Negative impact on cashflow. Interest charges incurred at 5.25% p.a. x $7.5m x 6 months = $197k - **TO BE UPDATED**	$190,000	***$1,900,000,000***	Project Cost (CV)	1%	1%	0.0%
ENG-03	Risk	All works	CuS under-resourcing	CuS may have underestimated the resources required to manage the contracts in an efficient manner Under-allocation of sufficient resources to manage the volume of administration work in terms of approval documents for design approvals etc. to enable the design to progress within the target timeframes If multiple DANs are submitted for review/approval, CuS may require more time to approve. Likely to occur early in the project if it does and/or at peak design submission periods.	Impacts include: - Burden on client resources - Delays in review/design feedback - Design delays, impact to overall project program - Failure to meet client specific requirements	Treatments include: - Identify key design milestones in program, allow appropriate time for design review, verify with CuS and other review stakeholders - Clarification sought with regards to the level of detail required and approval guidelines at each design milestone - Set up design review workshops to review designs and close out review process - Keep a design review feedback register to log comments - this is to supersede hand marked up drawings as feedback	$190,000	***$1,900,000,000***	Project Cost (CV)	1%	1%	0.0%
CIV-09	Risk	All Lines	Vegetation clearing Extent/ width Crane clearances? Midspan trees?	Uncertainty around the clearing scope and levels of vegetation. The fauna corridors are to be positioned in timbered areas at approximately 0.5km intervals or as directed by the Employer's representative. *Under the full width of the cross arms?*	*Access tracks are not to pass through the fauna corridor, but are to be constructed on an alignment nominated by the Employer's representative to loop around it into adjacent timbered areas. T*his would require rerouting the access tracks	Identify requirement for area to be classified as timbered areas and provide for alternate tracks at prospective fauna crossing location.	$176,763	***$17,676,312***	Clearing	10%	10%	1.0%
CIV-12	Risk	All Lines	Concrete placement and curing	Due to excessive transportation distances and weather temperature, concrete placement time limitations can be encountered resulting in cold joints due to overrun in concrete placement time and workability	Stand down of work crews and programme delays if concrete delivered to site is not workable. Concrete can go-off resulting in cold joints	Use of volumetric concrete mixers where the concrete is mixed adjacent to the place pour.	$167,623	***$33,524,517***	Concrete Supply	10%	5%	0.5%
TL-09	Risk	All Lines	Loss of livestock and crops	Landowners lose livestock and/or crops as a result of our activities e.g. depriving stock of water by leaving a gate closed	Impacts include: - compensation to farmers - delay costs - reputational damage	Treatments include: - Inductions of all personnel - IVMS fitted in all vehicles to monitor location - Colour tagging of gates to reflect the required 'as left' status of either 'Open' or 'Closed'	$100,000	***$1,000,000***	Landowner Property Loss / Damage Plugged #	20%	50%	10.0%
ENG-02	Risk	All works	JV Design approvals internal in meeting program	Program delays associated with the approval of permanent works design (Concept, detailed and final design) Late submission of design documents Non-compliant design Inadequate detail provided in design submission	Impacts include: - Delay to design program and overall project, including procurement. - Rework due to incorrect design, additional design costs - Noncompliance to design specification - Time and effort in educating stakeholders - Design is halted and cannot proceed	Treatments include: - Identify key design milestones in program, allow appropriate time for design review - Clarification sought with regards to the level of detail required and approval guidelines at each design milestone - Set up design review workshops to review designs and close out review process - Keep a design review feedback register to log comments - this is to supersede hand marked up drawings as feedback	$97,856	***$39,142,289***	Design Cost	5%	5%	0.3%
CIV-37	Risk	All Lines	Access track formation (temporary / permanent) including growth	Linear length of access tracks and/or access tracks specifications vary due to: - Access agreements not finalised or unable to be agreed - Changes in line routes - Bridge, council roads, rail crossings, etc to accommodate heavy equipment transportation - Challenging terrain - No-go zones such as CH, protected vegetation, waterways etc. - Changes due to UXO, chemical weapons, and mine waste contamination - Changes due to emerging data - Flood risk - Limited information at ECI stage	Impacts include: - Delays to design - Design rework - Changed specifications and performance - Delays to construction works - Increased project costs - Increased costs based on change in access assumptions - Incorrect assessment of road / bridge strengthening requirements	Treatments include: - understand prevailing access to site along alignment and identify critical areas that require further detailed analysis. - negotiate with landowners for alternative access in areas where possible. - Factor into design phase the access constraints to tower foundation locations considering seasonal impacts. - Review the map layers on CuS GIS system and assess the crossings data, other no go zones such as CH, protected vegetation, etc. - Liaise directly with Councils and other asset owners (such as Mines) for information - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design - Physically assess the access and access tracks to sites - Check Government Contamination Registers for any waste or nearby contamination locations - Map access tracks overlayed with no go zones based on information	$95,563	***$19,112,502***	Temporary Access Tracks	5%	10%	0.0%

CIV-38	Risk	All Lines	Skilled labour for concrete works (stubs / surveyors) in certain locations	Locations may impact varying levels of risk / availability - particularly through regional areas outside of townships and accommodation centres.	Impacts include: - Delay to program - Increased costs to attract skilled labour	Treatments include: - understand resource levels based on program with other works in region, North QLD and SE QLD, depending on particular skills. - engage with local labour and recruitment companies to verify skill levels and numbers available - Factor regional works and roster into remuneration packages and/or wages to attract and retain skilled workforce.	$83,811	***$33,524,517***	Concrete Supply	5%	5%	0.3%
CIV-28	Risk	All Lines	Piling Permanent liners	Permanent liners will be required for an extent of the piles along the tower alignment and will potentially be worth 30% of the total piling contract. An assessment of the qty of liners will be conducted based on current available Geotech information. Option to go for driven piles? (Design Register)	A larger or small qty of permanent piling liners may be required than nominated during the tender. Large cost overrun up to $35m	- Lock in subcontractor to liner supply risk - Qualify ground conditions in submission of bid - Price alternative screw pile or driven pile solution that does not rely on liners	$54,302	***$27,151,096***	TL Liners	10%	2%	0.2%
ENG-06	Risk	All Lines and Substations	Design and Engineering support during Construction Phase	Construction Phase Services (including Temporary Works) design budget overrun Construction Phase Service design budget may be exceeded due to changed conditions, SRFIs, re-designs, constructability issues, interface issues, approval issues.	Impacts include: - Design cost increase - Extended construction duration	Treatments include: - Experienced construction team members to participate in design reviews including consideration of temporary works requirements - Safety in Design workshop conducted with key construction personnel in attendance - Formal transmittal of all designs to site team via TeamBinder - Design to Construction Team handover meetings to ensure all aspects oft he design are understood - Maintain and track construction queries via Site RFI register - Track any construction team initiated design changes via the Change Management Process	$39,142	***$39,142,289***	Design Cost	10%	1%	0.1%
ENG-20	Risk	All Lines and Substations	Delays to design interfaces	Design inputs and interfaces: - RFI responses delayed or RFI feedback/responses that are vague/non-applicable/do not address original RFI query - Manufacturer/OEM information (including specs and drawings) - Power system studies output/modelling/reporting - Site survey/ground data information - Latent ground conditions without data - NSP, AEMO and other authority requirements	Impacts include: - Delays to design - Design rework - Changed specifications and performance - Delays to construction works - Increased project costs	Treatments include: - Engagement of an experienced Design Managers who fully understands the design constraints, design sequencing and timing requirements - Ensure that a robust RFI process is clearly articulated in the Design Management Plan including response times - Engage OEM's early to ensure required equipment information is available as required - Ensure sufficient geotechnical investigations/survey are carried out and no gaps in data at substations sites and along the transmission line alignment	$39,142	***$39,142,289***	Design Cost	5%	2%	0.1%
CIV-95	Risk	Substations	Ground conditions	More than expected unsuitable excavated soil for disposal and replacement with imported material, cost of disposal of unsuitable or contaminated materials, cost of importing suitable materials or treatment (e.g. blending, lime stabilisation etc.) of existing materials	Budget overspend, delay to schedule, remedial charges	Treatments include: - include sufficient contingency within the project schedule and budget - thorough investigation into local ground conditions during early works	$23,843	***$15,895,002***	Substation Foundations	5%	3%	0.2%
CIV-01	Risk	All Lines	Temp access track design	Based on limited geotechnical information, historical weather data and survey, an allowance will be made for the extent of access tracks to be constructed using imported quarry material and the associated maintenance costs during construction dependent on the soil geology and soil strengths along the alignment - assumptions made to interpolate between geotechnical data points. Culverts, causeways, creek crossings for waterway barrier work for access has been assumed under a desktop study.	Depending on weather and ground conditions, much more/less imported material may be required than allowed in the tender. Further allowance required on the assumptions made on waterway barrier crossings - pending delays in program, exposure to wet weather/flooding events, change in access track routes due to weather or unexpected delays in program.	Further assessment of the Geotech date by EIC and considering short design life of the tracks. Most of the track (subgrade has CBR) would require fewer treatment. Borrow pit have been identified along the alignment which could be source of cheap granular material for the track treatment.	$0	***$19,112,502***	Temporary Access Tracks	5%	0%	0.0%
ENG-25	Risk	All Lines	Access tracks growth	Linear length of access tracks and/or access tracks specifications vary due to: - Access agreements not finalised or unable to be agreed - Changes in line routes - Bridge, council roads, rail crossings, etc to accommodate heavy equipment transportation - Challenging terrain - No-go zones such as CH, protected vegetation, waterways etc. - Changes due to UXO, chemical weapons, and mine waste contamination - Changes due to emerging data - Flood risk - Limited information at ECI stage	Impacts include: - Delay to program - Increased costs based on change in access assumptions	Treatments include: - Review the map layers on CuS GIS system and assess the crossings data, other no go zones such as CH, protected vegetation, etc. - Liaise directly with Councils and other asset owners (such as Mines) for information - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design - Physically assess the access and access tracks to sites - Check Government Contamination Registers for any waste or nearby contamination locations - Map access tracks overlayed with no go zones based on information	$0	***$19,112,502***	Temporary Access Tracks	15%	0%	0.0%
CIV-117	Opportunity	All Lines	Reduction in Camp Capacity	Reduce overall camp capacity based on discipline approach - civils then electrical etc.	Opportunity Benefits: - Potential large cost saving Risk Impacts: - Project delays impacting on disciplines overlapping causing inadequate accommodation available - lost opportunity in cost saving	Treatment includes: - Review schedule to ensure work fronts are coordinated to facilitate discipline based camp approach along alignment - staging and work fronts.	$0	***-$124,897,087***	Camp Cost	2%	0%	0.0%
CIV-110	Risk	All Lines	Damage to infrastructure (incl underground services, railway lines, private roads/public roads etc)	Damaged to infrastructure when moving equipment, either in gauge or out of gauge via road, rail or on private property (EIS - early engagement required in general specifically with QR) or on private property		Quote from EIS Volume 2 Chap 13.6 Development of road use management plan Develop detailed dilapidation data and plan to manage areas of heavy traffic and concern. Note it would be worth considering a third party dilapidation survey? Ensure 3PL has the (HML) higher mass limits approvals thru NHVR Nation Heavy Vehicle Regulator) and certified road friendly suspension systems to reduce axle load impact and also approval to carry mass limits Suitably qualified personnel to conduct route clearances/inspections Suitable qualified traffic control to ensure road are traffic managed Traffic Management Plans	$0	***$5,800,607***	Construction Phase Services	10%		0.0%
ENG-26	Risk	All Sub-Stations	Control centre	JV has not done a Control Centre previously and this is not well defined in current project scope.	Impacts include: - Control centre does not function as required - Loss of data - Ongoing operability issue - Cyber security issues - Failure to meet NEM requirements for a TNSP	Treatments include: - Early engagement with OSII (Control Centre provider for PLQ) or equivalent control centre provider - Work with OSII or equivalent to develop specifications - Outsource or contract this part of scope to OSI (or equivalent)	$0	***$10,000,000***	Control Centre	15%		0.0%
CIV-120	Opportunity	All Lines	Civil Foundation Improvements	Reduce foundation design scope - pending geotechnical analysis	Opportunity Benefits: - Potential large cost and time saving Risk Impacts: - Timing of receipt of geotechnical information and adequacy to determine confidence in reduce footing/foundation scope	Treatment includes: - Complete field geotechnical investigation to determine existing geotechnical conditions and soil strength along alignment. - review opportunities for reduce design or alternative design to reduce overall cost and/or time	$0	***-$39,142,289***	Design Cost	10%	0%	0.0%
ENG-01	Risk	All works	Design not performing in accordance with the Program	JV designers or design consultants under our control, fail to deliver the design in accordance with design program Inability to mobilise sufficient experienced resources Shortcomings in design or changes due to latent	Impacts include: - Delay to design program and overall project, including procurement - Design rework due to correct design, additional design cost burdens	Treatments include: - Engagement of an experienced Design Managers who fully understand the design constraints, design sequencing and timing requirements	$0	***$39,142,289***	Design Cost	10%		0.0%
CIV-42	Risk	All Lines	Biological hazards	Hazards specific for certain locations to be identified	Impacts include: - Delay to program - Increased costs to remove and dispose of unknown/unexpected biological hazards	Treatments include: - understand prevailing geology of sites to determine likelihood of biological hazards. - make inquiries with landowners for location of any potential hazards - design to avoid - locate and negotiate reasonable contracts with local certified waste disposal facilities	$0	***$5,586,723***	Environmental Controls	10%	0%	0.0%
COM-16	Risk	All works	Escalation Accuracy	Escalation is higher than expected	Loss on escalation	Lock in suppliers early. Australia is a relatively stable market. Market data used to establish escalation rates in the tender EBA will be factored into the Project Obtain advice on projected escalation and incorporate into estimate.	$0	***$50,000,000***	Escalation	5%	0%	0.0%
PROC-37	Risk	All works	Cost Escalation	Competition from other projects or changing economic conditions (posed by recovery from Coronavirus) causes substantial cost increase for general materials and services not subject of formal quotation during tender e.g. fuel, quarry materials, cement, geofabric, food, construction water.	Cost overrun	Treatment as follows: - Early lock-in of purchase agreements with suppliers during Early Works (performed as part of Commitment Deed) - Negotiate a suitable cost escalation formula with CuString	$0	***$50,000,000***	Escalation	5%	0%	0.0%
COM-09	Risk	All works	Insurance - Insurable Events	Insurable event arises whereby a payment of the insurable excess on the insurable event is required E.g. Damage to plant or equipment, excessive weather event causes damage to the site.	Payment of excess for insurable event.	JV provides the following insurance - To be priced into the offer: - Contract Works & Third Party Liability - Public Liability - Marine Transit (TBM) - Marine Transit ($xxk) - Plant & Equipment ($xxk) - Motor Vehicle ($xxk) - Professional Indemnity ($xxm) - Workers Compensation ($-)	$0	***$27,245,125***	Insurance	3%	0%	0.0%
PROC-10	Risk	All works	Insurance - Uninsured losses (Permanent works)	General uninsured losses arising out of damage events to the works less than the excess	Payment of full rectification costs.	Allowances for rectification of incidents: -	$0	***$27,245,125***	Insurance	10%	0%	0.0%
CIV-51	Risk	All Lines	Availability of People, Plant and Equipment resources	Insufficient plant, people and equipment resources able to be locked in to the project to meet the program due to high volume of NQLD, SEQLD projects currently underway or about to commence along with other key projects in the region. Particularly, civil plant and experienced operators.	Impacts include: - Delay to program - Increased costs to attract resources to the project	Treatments include: - understand resource levels based on program with other works in region, North QLD and SE QLD, depending on particular skills. - engage with local labour and recruitment companies to verify skill levels and numbers available - Factor regional works and roster into remuneration packages and/or wages to attract and retain skilled workforce.	$0	***$165,754,975***	Blue Collar Costs	2%		0.0%
HRIR-04	Risk		COVID - Boarder restrictions	Delay in getting resources to site due to boarder closures	Impacts include: - Reduced productivity causing a delay in the program - Additional cost in standdown and potential quarantine requirements	Treatments include: - Engage local labour first - Engage labour from the region second - Engage labour from the state third - Interstate labour last resort - Monitor COVID vacancies and align with employment medicals - Encourage staff to remain in area on RnR or option to relocate	$0	***$165,754,975***	Blue Collar Costs	10%		0.0%
HRIR-13	Risk	All works	Separate Project Agreements cause friction between work teams	Each of the JV partners will negotiate Project Agreements to cover their relevant work. CPB will put in place a Project Agreement covering civil works and UGL will put in place an agreement covering electrical and substation works.	Impacts include: - friction within the workforce	Treatments include: - Ensure respective JV partners have a current Enterprise Agreement in place to cover the duration of the work; - Where an Agreement is due to expire during the contract, ensure a replacement Agreement is in in place before expiry securing the work from protected industrial action	$0	***$165,754,975***	Blue Collar Costs	2%	0%	0.0%
SS-24	Risk	All Sub-Stations	Retention of site resources	Staff turnover could be potentially high reducing quality increasing staffing training costs.	Lack of job knowledge, increased inductions, increased training requirements, inferior quality, lack of continuity	Treatments include: - implementation of robust EBA scheme - early recruitment of key staff positions - introduction of bonus scheme based on completing the project / time served	$0	***$165,754,975***	Blue Collar Costs	5%	0%	0.0%
CIV-116	Opportunity	All Lines	Reduction in Camp Number	Reduce total number of camps along alignment by increasing travel time (maintaining DIDO safety requirements i.e. no greater than 90mins)	Opportunity Benefits: - Potential large cost saving Risk Impacts: - Increased travel time for workforce, fatigue management, complying with health and safety requirements etc.	Treatment includes: - detailed analysis during ECI to determine travel times on reduced camp locations / increased spacing between camps. - Risk assess travel times and fatigue management based on duration of shift on site and travel time.	$0	***-$285,269,530***	Labour Blue Collar & White Collar	5%	0%	0.0%

CIV-118	Opportunity	All Lines	Schedule Improvements	Reduce overall construction schedule - reduce overhead costs by increasing productivity	Opportunity Benefits: - Potential large cost (overheads) and time saving Risk Impacts: - Availability of resources to complete works at multiple fronts to reduce project duration.	Treatment includes: - review schedule to increase productivity with alternative plant/equipment or multiple work fronts and crews to reduce duration of project.	$0	***-$285,269,530***	Labour Blue Collar & White Collar	10%	0%	0.0%
CIV-119	Opportunity	All Lines	Productivity Improvements	Increase civil productivity with multiple crews and work fronts to reduce overall duration of civil works and risk exposure to wet season	Opportunity Benefits: - Potential large cost (overheads) and time saving Risk Impacts: - Availability of resources to complete works at multiple fronts to reduce project duration.	Treatment includes: - review schedule to increase productivity with alternative plant/equipment or multiple work fronts and crews to reduce duration of project.	$0	***-$285,269,530***	Labour Blue Collar & White Collar	5%	0%	0.0%
HRIR-14	Risk	All works	Heat clause	EA may contain limits on working temperatures which impact on productive time.	Impacts include: - Lost productive work time and resultant program delays - More night work at penalty rates	Treatments include - aim to avoid a heat clause in EA - program contingency	$0	***-$285,269,530***	Labour Blue Collar & White Collar	10%	0%	0.0%
TL-04	Risk	All Lines	Conductor stringing	We encounter sensitive areas that prohibit conventional stringing methods and we are obliged to use drone stringing methods	Impacts include: - additional cost for drone stringing - delay costs	Treatments include: - conduct a thorough line route investigation - allow for drone stringing in base estimate where investigations confirm this requirement - consider cost and time opportunity with drone stringing c.f. conventional stringing considering biodiversity offsets - Qualify based on no EIS or Cultural Heritage Information	$0	***$36,299,652***	Labour Stringing (OPGW & Conductor)	2%	0%	0.0%
CIV-115	Opportunity	All Lines	Borrow Pit Availability (incl. quarry availability - maybe closed / redundant)	There is an opportunity to establish borrow pits to supply large qtys of fill material to the substations, potentially saving millions of dollars instead of using quarry products. May need to qualify EIS approval (licences & royalties) *Unlikely that borrow pit material will meet the ER for permanent works. Use only for access tracks. AD*	Potential large cost saving	Early EIC involvement to include borrow pit proposals in EIS document will prevent delays and increase chance of timely approval.	$0	***-$32,653,625***	Quarry Materials	15%	0%	0.0%
CIV-55	Risk	All Lines	Material Rate Movements	Market movements on steel, diesel etc due to world market changes - increased from ECI	Impacts include: - Potential delay to program - long lead time items - Increased costs	Treatments include: - quotes during ECI to be requested to remain valid under project commencement. - Notify client of impacts of potential delay on cost and program in the event of upfront delays to project commencement.	$0	***$800,832,655***	TL & Substation Primary Equipment	2%	0%	0.0%
FIN-05	Risk	All works	Accounts Payable	Orders for Goods & services placed without an approved CPBUGL JV contract in place signed in accordance with relevant DOA.	Supplier/subcontractor submit claims to CPBUGL JV for work that was not formally approved by the CPBUGL JV in accordance with the DOA or the work done was not known about, however the subcontractor has evidence of agreement with site personnel. CPBUGL JV has to pay for work despite there being no formal agreement.		$0	***$1,190,500,000***	Materials & Subcontractor	1%	0%	0.0%
CIV-22	Risk	All Lines	Site Conditions - contamination	JV encounters contaminated ground (unknown unsuitable materials) during excavation of access roads, substation benches and foundations - salt affected, acid sulphate soils, leaching from creosote impregnated poles in pole dumps, old sheep/cattle dips.	Impacts include: - cost of remediation - cost of treatment - cost of monitoring during further excavation (hygienists) - delay costs	Treatments include: - understand prevailing geology of sites to determine likelihood of salt affected soils and perform targeted Geotech - design for minimal ground disturbance - where salt affected soils determined, use additives in concrete mixes (SR Grade cement or micropos) to enhance durability of foundations - make inquiries of landowners for location of any old pole dumps and sheep/cattle dips - design to avoid - subject to legislative approval, blend contaminated soils with non-contaminated soil so that contamination threshold is avoided - locate and negotiate reasonable contracts with local certified waste disposal facilities	$0	***$0***	Not in scope	0%	0%	0.0%
CIV-22	Risk	All Lines	Site Conditions - contamination	JV encounters contaminated ground (unknown unsuitable materials) during excavation of access roads, substation benches and foundations - salt affected, acid sulphate soils, leaching from creosote impregnated poles in pole dumps, old sheep/cattle dips.	Impacts include: - cost of remediation - cost of treatment - cost of monitoring during further excavation (hygienists) - delay costs	Treatments include: - understand prevailing geology of sites to determine likelihood of salt affected soils and perform targeted Geotech - design for minimal ground disturbance - where salt affected soils determined, use additives in concrete mixes (SR Grade cement or micropos) to enhance durability of foundations - make inquiries of landowners for location of any old pole dumps and sheep/cattle dips - design to avoid - subject to legislative approval, blend contaminated soils with non-contaminated soil so that contamination threshold is avoided - locate and negotiate reasonable contracts with local certified waste disposal facilities	$0	***$0***	Not in scope	0%	0%	0.0%
CIV-43	Risk	All Lines	UXO Identification and Unknown Underground UXO	Underground UXO - West of Woodstock underground, particularly Lot 4004 on SP242524 with a substantial occurrence and all other minor occurrences identified.	Impacts include: - Fatalities, lost time injuries - Delay to program - Increased costs to stop works and remove - Safety risk on personnel and plant completing ground excavation and/or foundations, damage to plant and equipment.	Treatments include: - Engage UXO specialist to conduct a survey of the risk areas between WDS and FLR where known ordnance may be present. - complete adequate number and location(s) of non-intrusive investigations - investigate all existing plans - Liaise directly with military authority and follow processes undertaken to identify, survey, locate and/or remove, if encountered. - Suitable training requirements for all personnel - Insurances to include risk	$0	***$0***	Not in scope	0%	0%	0.0%
CIV-75	Risk	All Lines	Contaminated land / buildings including asbestos	Contaminated land sites on the EMR (includes 18 no. sites) potential for unknown further contaminated land and / or buildings to be discovered along alignment. NB: Mt Isa is on an old sediment pond from the old power station.	Additional costs and time delay due to additional surveys and investigations required, included where necessary specialist removal of debris / material outside of known contaminated material sites, particularly regional farm land with cattle dips, etc.	Treatments include: - complete full surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans nearby - check local history of plant / building use nearby and / or in situ	$0	***$0***	Not in scope	0%	0%	0.0%
SS-39	Opportunity	All Sub-Stations	Powerlink operational requirements	Unforeseen Powerlink operational requirements affecting project(s). (Check TXL crossings ?)	Outage delays and re-sequencing of key pre-commissioning activities required.	Treatments include: - sufficient contingency to be included within the overall project schedule - risk to be written out of JV contract (removal of LD's for this element)	$0	***$0***	Not in scope	0%	0%	0.0%
COM-06	Risk	All works	Change in Law (International)	Increased costs incurred as a result of changes in law.	Increase cost/time to deliver project, increased duration to approvals processes	Changes in law will give rise to adjustment?? of the contract price upon agreement with the CuString Representative (Deed - Clause xx) Change in law to be qualified as not retrospective	$0	***$800,832,655***	TL & Substation Primary Equipment	10%	0%	0.0%
FIN-10	Risk	All works	Foreign Exchange	Exchange rate risk up till signing of contract	If CPBUGL JV takes on risk from start, this will be built into the price. If client takes on risk till sign contract, just include cost of hedging in contract price.	Hedging as soon as possible. This will be dependant on who takes on risk.	$0	***$175,194,267***	Substation Primary Plant	3%	0%	0.0%
FIN-11	Risk	All works	Foreign Exchange	Commodity price risk	Significant price fluctuation from the tender price till sign up supply contract.	Fix price with suppliers or hedge commodity prices	$0	***$175,194,267***	Substation Primary Plant	4%	0%	0.0%
COM-05	Risk	All works	Currency exchange rate variations (General)	Exposure to currency exchange rate fluctuations on currencies other than $AUD Allow for the NTP sunset date exposure	Increased procurement costs on procured items from outside Australia due to timing of payments in foreign currency.	Wherever possible get quotes in $AUD. All costs in foreign currencies (EURO and US = AUD $XXm total) will be hedged and hedging costs included in estimate. Qualification to be submitted to provide adjustment of exchange rate sums upon award at which time values will be hedged - JV will not take on currency exchange risk.	$0	***$297,444,240***	Primary Plant & installation	5%	0%	0.0%
CIV-47	Risk	All Lines	Wet Season Schedule Impacts resulting from the change in NTP	Impacts on the civil works program should delays be encountered pushing further civil works in the wet season to meet program - affecting production and requiring design adjustment to facilitate temporary access - i.e. additional gravel, fill, waterway crossings etc.	Impacts include: - Delay to program - Increased costs to reschedule sequence of works	Treatments include: - detailed assessment during ECI on productivities and number of work crews/fronts to ensure civil works completed during dry season	$0	***$1,900,000,000***	Project Cost (CV)	10%	0%	0.0%
CIV-50	Risk	All Lines	Flooding Events	Delays experienced to civil works program impacting on the civil works extending into the wet season and potential flooding of low-lying areas (i.e. Julia Creek area)	Impacts include: - Delay to program - Increased costs in rectification, additional use of gravels for all weather access to allow program to continue and/or waterway barrier crossings required to maintain access	Treatments include: - detailed assessment during ECI on productivities and number of work crews/fronts to ensure civil works completed during dry season	$0	***$1,900,000,000***	Project Cost (CV)	10%	0%	0.0%
CIV-91	Risk	All Lines	Multiple tasks	Accelerated programme of works resulting in multiple tasks being undertaken within close proximity to each other	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - undertake SID workshops - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to heavy equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0	***$1,900,000,000***	Project Cost (CV)	0%	0%	0.0%
STAK-04	Risk	All works	Delay in the CuString conclusion of property agreements	Potential for major line route changes - Also potential for inclusion of additional angle points and exclusion zones (sensitive areas) - increasing the costs of structures	Delays, change to centreline and lack of credible survey/LiDAR, introduction of additional consent conditions with new land owners, new gates, fences and accesses etc Renogiation of conditions with Landowners and Regulator	Treatments include: - ensure activity is included in project program as a critical task - actively engage with CuString to ensure they understand the criticality of the approval and have the approvals activity under control -	$0	***$1,900,000,000***	Project Cost (CV)	0%	0%	0.0%
STAK-13	Risk	All works	Late site access	CuString experiences delay in securing environmental or development approvals or landowner access which impacts on possession of site dates	Impacts include: - bid revalidation costs - designated project team standby costs - recruitment costs - some designated staff may not be prepared to wait and need to be replaced - impact on delivery	Treatments include: - negotiate with CuString at time of ECI, to pay for bid revalidation, staff retention and any recruitment costs	$0	***$1,900,000,000***	Project Cost (CV)	1%	0%	0.0%
TL-02	Risk	All Works	Extraordinary inclement weather - electrical	Extraordinary inclement weather due to unseasonal wet weather, high wind or heat or persistent or intense wet weather results in standby and damage to access roads, hardstands, benches and excavations - earthworks	Impacts include: - cost for delay - cost for plant and labour standby - cost of lower productivity during hot weather - cost of remedial works - cost of insurance excess	Treatment includes: - plan construction works for dryer season where possible - ensure construction planning is consistent with weather forecast - it may be necessary to relocate to a less affected part of the site - hold appropriate insurances	$0	***$1,900,000,000***	Project Cost (CV)	5%	0%	0.0%
CIV-112	Risk	All Lines	Upgrading Existing Road Conditions	Turnoff points at Flinders Hwy (and others) etc will need upgrading for bitumen turnoff as road edges are fragile.	Impacts include: - Delay to program - Additional project costs for upgrading existing infrastructure for project needs	Treatment includes: - Site investigation on access roads used for logistics, deliveries etc for the project to determine potential infrastructure upgrades that may be required as part of the project works.	$0	***$3,964,595***	Permanent Road works	10%	0%	0.0%
CIV-31	Risk	All Lines	Wear and tear on council roads	Councils require JV to repair public roads / bridges / road furniture etc damage from deliveries of plant/equipment & materials - additionally local private roads and accesses - refer No. 39	Impacts include: - cost of repair - loss of reputation	Treatments include: - perform a Dilapidation Study before and after to determine the extent of repair works needed - monitor traffic movement using VMS and observation of non project traffic - perform regular inspections and have roads maintained accordingly (use council or approved contractor) - implement ongoing engagement with councils as required by Community and Stakeholder Management Plan	$0	***$3,964,595***	Permanent Road works	10%	0%	0.0%

CIV-99	Risk	All Works	High risk activities	JV employees (or a 3rd party for which JV is responsible) carry out work with a foreseeable high risk, including (but not limited to) at height, in confined spaces, live electricity, overseas travel (to hazardous locations), abandoned sites, working in and around mobile plant	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to live equipment / plant / heavy equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards - adherence to JV policies and procedures	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HRIR-38	Risk	All works	Medical readiness	Insufficient allowances for medical facilities, response capability / availability For example on site medical facilities, helicopter rescue flights, 24/7 coverage, nurses, etc. Snake bite responses will be a particular concern.	Impacts include: - Lack of emergency readiness - Exacerbated medical outcomes - Additional costs - Delay costs - Loss of reputation	Treatments include: - Prepare an effective Emergency Response Plan - Arrange sufficient first aid kits and trained personnel - Engage local medical centre, hospital, clinics - Information available on all notice boards (all locations) for local emergency services - Arrange fire fighting equipment suitable to works and work locations - Ensure all equipment is regularly inspected and maintained	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HRIR-39	Risk	All works	Traffic accidents	Traffic accident on public road or at site resulting in injury, vehicle and other asset damage	Impacts include: - Safety impacts - Cost of vehicle/asset damage to value of insurance excess	Treatments include: - install IVMS into all vehicles - prepare and implement an effective Traffic Management Plan - provide separate entry/egress points to the sites - implement clearly labelled pathways and traffic access points - prepare and implement a Fatigue Management Plan - ensure camps are located such that travel times between camp and work site are reasonable - implement effective insurance policies - use of temporary/permanent fencing	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HRIR-41	Risk	All works	Dealing with mental health issues	Impacts on the mental health of the workforce resulting from the roster/ FIFO conditions.	Impacts include: - lost time due to mental health issues - Self harm	Treatments include: - implement a site mental health program including availability of councillors - regular organised events	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HSE-18	Risk	All works	Working in or near a Confined Space	Engulfment/Asphyxiation/Drowning resulting in death or serious injury	Criminal Prosecution/Liability Loss of Reputation Fine WHS Act/Regs Delays Adverse State Media or public attention. Federal/State Government scrutiny	UGL CRC - 3 3.1 Confined spaces are identified by a competent person and appropriate signage applied. 3.2 Work planning processes consider whether the requirement to enter a confined space can be eliminated. 3.3 Personnel involved in confined space work have attained applicable training and competency for; – Working in a confined space – Atmospheric monitoring of confined space – Supervision of confined space work. 3.4 Any systems likely to influence the atmospheric or physical status of a confined space are identified, purged and/or confirmed isolated before entry into the confined space. 3.5 Working in confined space is authorised by a permit and rescue plan, which is subject to regular testing. 3.6 Prior to entry, testing of atmospheric conditions is undertaken utilising calibrated equipment. 3.7 Confined space entrants wear a harness to facilitate rescue in the event of an emergency. 3.8 Confined space sentry/standby persons are located outside of the confined space at all times when the confined space is occupied; they have no other duties during the confined space entry. 3.9 Where there is a risk of atmospheric hazards, continuous monitoring of the atmosphere is undertaken by a dedicated sentry/standby person whilst confined space work is performed. 3.10 Sentries have an effective means of two-way communication with confined space entrants and a method of activating an emergency response Confined Space Code of Practice 2021 UGL Confined Space Procedure	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HSE-20	Risk	All works	Fire/Explosion	Site building or bush fire	Fatality or serious permanent injury due to burns Damage to property, flora, Fauna, Livestock and environment Loss of Reputation Fine WHS Act/Regs/EPA Adverse State Media or public attention. Federal/State Government scrutiny	Follow QFES Fire Ban Notice/Requirements Early Notification/attendance QFES Availability of water trucks Permit System for Hot Works	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HSE-25	Risk	All works	Working at Height > 2m	Gravitational Energy	Fatality or serious permanent injury due to fall, or suspension trauma Fatality or serious permanent injury due to dropped object falling on person	need to work at height: including the design of new buildings, plant and equipment, towers 2. Fall restraint or fall arrest equipment is utilised when working at height and the provision of a secure working platform is not practicable. Workers at Height wear full body harnesses that incorporate shock absorbing lanyards or inertia reels. Purpose designed anchor points are certified by a competent person. 3. Ground conditions are assessed and verified as solid, stable and suitable for elevated work platform operations. 4. Protection from falling objects is provided through primary controls such as edge protection (encapsulation), with exclusion zones and/or overhead protection provided as a secondary means of control. 5. Pre-start and periodic inspections by a competent person are completed to confirm that working at height equipment (including elevated work platforms and scaffolding) is fit for purpose and can be used and maintained in accordance with OEM and statutory requirements. 6. Everyone undertaking or supervising work at heights is trained and competent to understand working at height hazards and controls. 7. Working at height activity is authorised by, and conducted in accordance with, a permit and rescue plan. Permits are also utilised for the removal of penetration covers, guard rails or grid mesh that expose a worker to a fall from height. 8. Hand tools and equipment used whilst working at height have secondary securing mechanisms such as	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HSE-26	Opportunity	All Works	Working at Height > 2m	Gravitational Energy	Fatality or serious permanent injury due to fall, or suspension trauma Fatality or serious permanent injury due to dropped object falling on person	Reduce the need to work at height utilising the Pin and Pot Process during the design process and Construction Phases. In addition to consider the use of guide plates attached to the lower tower sections.	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
HSE-29	Risk	All works	Energy Isolation	Electrical, Mechanical, Pneumatic or hydraulic hazard	Fatality or serious injury to workers due to electric shock or electrocution, sudden release of energy causing crush, shear, cut or striking injury, or Contact with high pressure fluid	UGL CRC Protocol - 6 6.1 Equipment that is purchased and equipment that is designed includes lockable isolation points for hazardous energy sources. Each isolation point is labelled with a unique identifier. 6.2 All hazardous energy sources are identified, de-energised and physically isolated prior to working on equipment/systems, with safe work methodologies for protection of services that cannot be isolated. 6.3 All energy sources and equipment are treated as live until tested for dead by a competent person. 6.4 Work planning includes identification and isolation of sources of hazardous energy by a competent supervisor. 6.5 Personnel about to commence working on plant or equipment conduct isolation checks before placing their Personal Danger Tags and Locks. 6.6 Energy isolation activities are authorised by a permit which identifies each isolation point and specifies the test requirements for the presence of hazardous materials/stored energy. 6.7 Each person that performs work under an energy isolation is trained and competent. Physical isolation, de-isolation and any isolation changes are completed and communicated by a competent and authorised person. 6.8 Isolation points are clearly identified, proven, labelled, locked and controlled to prevent inadvertent energising.	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
SS-59	Risk	All Sub-Stations	Live equipment	Live substation / equipment adjacent to working areas	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to live equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
SS-63	Risk	All Sub-Stations	Explosion	Existing and / or new HV equipment failure, notably transformers due to partial discharge	Injury, fatality, equipment damage, prosecution by WorkSafe	Treatments include: - early identification of existing RED zones - site restriction imposed by temporary / permanent fencing - installation of blast walls / protective barriers - daily monitoring of equipment of partial discharge prior to pre-starts - JV safety procedures adhered to for working in proximity to live equipment - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
SS-72	Risk	All Sub-Stations	Visitor injury	Following causes including poor planning, poor housekeeping, poor training	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - site restriction imposed by temporary / permanent fencing - safety procedures adhered to for working in proximity to live equipment / plant / heavy equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards - adherence to JV policies and procedures, specifically for planning, PPE and audits	$0	***$888,790***	PPE Equipment	0%	0%	0.0%

SS-78	Risk	All Sub-Stations	Failure of rigging equipment	Damage to workers, crush injuries	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - equipment to be rigged by competent dogman / rigger only - inspection of all rigging equipment daily and as per AS standards - do not exceed SWL of Rigging Equipment - use of correct lifting equipment appropriate to task i.e.; chains, slings etc. - lift equipment from designated lifting points - refer to manuals as required - never stand under suspended loads - use of tagline - clear communication between dogman / operator	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
SS-79	Risk	All Sub-Stations	Falling from heights	Work at heights, use of ladder, mobile scaffolding, EWP, fall protection using harness	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - platform ladders, aluminium scaffolding erected in accordance with standards - access to scaffolding platform via internal ladder and workers to remain inside scaffold at all times - check condition prior to use - select correct type of ladder for works e.g. fibreglass for electrical work - set up on stable ground, avoid sinking in muddy ground - tie off where possible, foot ladder - 3 points of contact - extension ladders for access and egress only - risk assessment must be completed	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
SS-87	Risk	All Sub-Stations	Heavy plant and / or equipment movement; graders, trucks, excavators, transformers, syncon units	Crush injuries, plant failure	Impacts include personal injury or death	Treatments include: - supervision / monitoring - designated access - delineate work area - designated stockpile area - clear communication between operators - inspection of all plant prior to works commencing - maintain equipment - movement sirens, flashing beacons - competent operators - do not stand behind operating equipment - ensure safety pins are secured prior to use - (excavator attachments)	$0	***$888,790***	PPE Equipment	0%	0%	0.0%
FIN-02	Risk	All works	Financial system set up	Poor set up of financial system at commencement of project	Lack of confidence in CPBUGL JV ability to report effectively.		$0	***$112,370,710***	White Collar Costs	1%	0%	0.0%
CIV-52	Risk	All Lines	Subcontractor Costs Increased from ECI estimate.	Any delay in the program award and procurement could result in increased costs to all subcontractors and suppliers based on resource availability and current market.	Impacts include: - Delay to program - Increased costs to attract resources to the project	Treatments include: - quotes during ECI to be requested to remain valid under project commencement. - Notify client of impacts of potential delay on cost and program in the event of upfront delays to project commencement.	$0	***$606,700,000***	Subcontractor	5%	0%	0.0%
COM-18	Risk	All works	Critical Interdependent Projects are not delivered in time	Critical Interdependent Projects as anticipated by Concept of Operations are not delivered in time for MM day 1, or do not operate as expected, leading to uncosted legacy infrastructure required, or inability to achieve expected level of service.	Suboptimal outcomes and loss of reputation, Delays.	1) Interdependent projects have been identified. 2) Early and continuous engagement with other Project Leaders to enable regular communication of respective project programs. 3) Interface Control Documents have been developed with the critical interdependent projects to maintain communication and coordination.	$0	***$606,700,000***	Subcontractor	2%		0.0%
PROC-18	Risk	All works	Critical Interdependent Projects are not delivered in time	Critical Interdependent Projects as anticipated by Concept of Operations are not delivered in time for MM day 1, or do not operate as expected, leading to uncosted legacy infrastructure required, or inability to achieve expected level of service.	Suboptimal outcomes and loss of reputation, Delays.	1) Interdependent projects have been identified. 2) Early and continuous engagement with other Project Leaders to enable regular communication of respective project programs. 3) Interface Control Documents have been developed with the critical interdependent projects to maintain communication and coordination.	$0	***$606,700,000***	Subcontractor	2%	0%	0.0%
ENG-09	Risk	All works	Substation design growth	Foundations quantities vary due to: - total number varies - rebar qtys - load cases - bearing capacity - durability considerations - concrete grades - reactive equipment sizes Drainage, conduits and cable trench quantities vary due to general design development Steelwork quantities vary due to:: - final detailing - loading finalisation - durability issues/ protective coatings spec - height adjustments	Impacts include: - Increased design costs - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Engagement of an experienced Design Managers who fully understands the design constraints, design sequencing and timing requirements - Design leads and teams to understand the basis of the estimate and design to the estimate - Identify critical packages (e.g. foundation concrete, foundation steel, earthworks cut/fill, tower steel mass) to be tracked through the design process and reviewed against estimate at each design review - Designers to continue to develop cost saving alternatives (either in materials quantities or time related savings) where possible to reduce growth - Design Manager and Design Leads to follow Change Management Process when change occurs	$0	***$15,895,002***	Substation Foundations	10%	0%	0.0%
ENG-13	Risk	All works	TXL foundations quantity split	Transmission Line foundation type qty split varies due to limited Geotech information at ECI stage	Impacts include: - Increased design costs - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Carry out as much geotechnical investigations as possible during the ECI phase - Continue geotechnical investigations during EPC contract negotiations to allow refinement of the foundation type quantities, and foundation designs to reduce risk	$0	***$149,205,952***	TL Foundations	10%	0%	0.0%
CIV-70	Risk	All Lines	Geotech risk	Information provided during the Tender stage is known to be incomplete and could cause issues during earthworks / civil activities.	Unknown underground hazards resulting in design changes and or construction delays	Treatments include: - complete Geotech / LIDAR studies in all areas of work during the early works stages - request Powerlink providing the Geotech / LIDAR - exclude delays caused by the risk of underground issues during tender stage	$0	***$149,205,952***	TL Foundations	5%	0%	0.0%
CIV-25	Risk	All Lines	Foundation types Variability due to Geotech (incl. access requirements)	Due to 'actual' ground conditions, risk is that the assumed percentage of bored undercut foundations vs straight sided/sleeved foundations is incorrect. (Design Register)	Impacts include: - cost overrun - delay costs	Treatments include: Treatments to avoid expensive full-length liners or abandonment of foundation type include: - conduct ID drilling for each tower to determine the nature of clay/sand materials (cost ~$1K to be included in base estimate) - where necessary, use hydraulically inserted surface casing to overcome surface sand collapse - can be separate crew - where necessary, use continuous flight augers to compact sand and have capability for injecting stabilising polymers to prevent collapse of the walls of the bored excavation - separate crew - use undercutting bucket for belling the bottom of bored excavation to reduce foundation length - separate crew - plant and equipment to be flexible so as to adapt to different conditions rather than having to mobilise other plant - conduct testing to confirm integrity of bored and undercut solution and need for surface liners and/or continuous flight auger with polymer injection facility	$0	***$149,205,952***	TL Foundations	10%	0%	0.0%
CIV-53	Risk	All Lines	Dewatering	Inadequate run-off or high ground water experienced during foundation excavation / construction and access track construction through low-lying areas and adjacent to creek crossings.	Impacts include: - Delay to program - Delay costs	Treatments include: - scheduling of civil works in the dry season - temporary ERSED and dewatering management along the alignment incorporated into ECI estimate to ensure compliance.	$0	***$149,205,952***	TL Foundations	10%		0.0%
ENG-29	Risk	All works	Efflux	Changes to water level and water flows may impact landowners as a result of terrain changes (i.e. creation of water flow barriers) that inhibit water flow/drainage.	Escalated project costs due to compensation requirements sought by landowners due to flooding	Treatments include: - Review of map layers on CuS GIS system and assess the flood data, and water ways - Consider historical flood data, public domain data and discuss with landowners on flood levels if available - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design - Hydrology studies carried out as part of detailed design	$0	***$149,205,952***	TL Foundations	5%		0.0%
CIV-27	Risk	All Lines	Piling Geotechnical conditions	Variations in piling scope (depths, lengths, diameters, etc) caused by variable geotechnical conditions. (Design Register) Also abandoned holes	Additional cost and potentially delays	- Poor Sand foundations have been specified as driven piles instead of bored, increasing process certainty. - Potential use of screw piles for sandy conditions in particular reduces chance of excavation collapse. - Commitment in the tender budget to allocating CPT and ID drilling budgets which will greatly reduce the chance of unplanned additional work late in the project	$0	***$149,205,952***	TL Foundations	5%	0%	0.0%
ENG-07	Risk	All works	Site investigation costs	Insufficient allowances & increased requirements for site investigations including geotechnical studies, initial site survey, ID drilling, micrositing, etc.	Impacts include: - Delays to design input - Delays to designs - Provisions for micrositing to cater for site specific variations requires additional resources for these assessments - Changes to design, quantities, and costs (re-design, materials and construction)	Treatments include: - Detailed investigation plan, provision of both investigation locations and schedules - Depending on Contractual agreement, include Schedule of Rates for any additional site investigation required - Contingency allowance for risk of latent/site specific condition - Engage experienced geologist to interpret geological maps for likely Geotech conditions followed by any targeted Geotech survey (i.e. EIC) - work with EIC regarding alternative geotechnical investigation methods/strategy to obtain data at higher resolution - design a suite of foundation types for towers and substation structures from which one can be selected by the project engineer with possible assistance from the geotechnical engineer to suit the prevailing soil conditions	$0	***$149,205,952***	TL Foundations& Substation Foundations	5%	0%	0.0%
ENG-37	Risk	All works	Easement acquisition	Delays to or non-acquisition of easement land parcels.	Impacts include: - Delays to design - Design re-work - Delays to construction works - Increased project costs	Treatments include: - CuS to identify status of all land parcels in the CuS GIS system, regularly updated and notified to UGL as acquisition process progresses - Any change to land parcel site and size to be managed via Change Management Process - CuS have land access acquisition in place prior to financial close	$0	***$165,100,954***	TL Foundations& Substation Foundations	15%		0.0%
CIV-26	risk	All Lines	Soft ground requiring redesign/removal/stabilisation	Soft ground may require special foundations. (Design Register)	Impacts include: - cost overrun	Treatments include: - conduct Geotech investigation to confirm conditions - should Geotech investigation confirm presence of soft ground, design and install piled foundation and include for this in the base estimate	$0	***$165,100,954***	TL Foundations& Substation Foundations	5%	0%	0.0%
ENG-36	Risk	All works	3rd party approvals	Approvals from 3rd Parties such as AEMO, PLQ, Energy Queensland, local councils may delay design, construction and energisation	Impacts include: - Delays to design - Design re-work - Changed specifications and performance - Delays to construction works - Delays to energisation	Treatments include: - Identify all 3rd party approvals required and include in the design program	$0	***$165,100,954***	TL Foundations& Substation Foundations	3%	0%	0.0%
SS-37	Risk	All Sub-Stations	Network design	Powerlink network design does not meet performance or integrity requirements. (Design issue)	JV cannot fulfil contractual requirements	Treatments include: - risk to be written out of JV responsibility - CuString to provide written guarantees that the existing system will be adequate	$0	***$165,100,954***	TL Foundations& Substation Foundations	5%	0%	0.0%

TL-08	Risk	All Lines	Rework - poor fabrication	Foreign sourced structural steel requires significant rework including replacement of tower members, redrilling holes, regalvanising etc in excess of any allowance included in the base estimate for rectification of defects in the Defects Liability Period.	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - assign expat expeditor to factory to ensure quality and packaging requirements are observed - ensure supply contract contains appropriate cost recovery provisions for any site rework - JV designers/drafters present for prototyping and testing at factory to check members and fittings	$0	***$111,209,109***	Transmission Line Tower Steel	5%	0%	0.0%
SS-03	Opportunity	All Sub-Stations	Excess topsoil	Excess topsoil to be removed off site in accordance with Powerlink spec. (top 1.5m)	Potential to deliver topsoil to local land owners saving the project long hauls and potential disposal costs.	Treatments include: Early engagement of land owners in order to locate an amenable farmer and organise enviro approvals in time.	$0	***-$426,751***	Vegetation Clearing	10%	0%	0.0%
CIV-14	Risk	All Lines	Shortage of construction water for batch plants	Insufficient (including poor quality water not meeting specifications for concrete mix design) water available to supply the needs of concrete batching plants	Impacts include: - cost overrun - delay costs	Treatments include: - investigate availability of sufficient suitable free standing water at proposed locations of batch plants at time of tender - in the absence of free standing water, investigate availability of bore water and required license to use at proposed locations of batch plants RIVERS!	$0	***$4,909,203***	Construction Water	30%	0%	0.0%
CIV-02	Risk	All Lines	Temp access track remediation	Remediation costs for access roads blow out due to difficulty in disposal of road base materials from access roads and hardstands, where there is no design, completed work areas will be rehabilitated as agreed with the landowner. Following wet weather rectification works - particularly Selwyn region, in terms of restricted access.	If remediation extents are not captured in the design documentation, landowner requirements for remediation will be unknown at time of bid submission. E.g. imported quarry material may require disposal off-site depending on the landowner agreement - or stockpiled for their use.	Treatments include: - negotiate with landowners to leave access tracks in situ or stockpile on their land - negotiate sale of material to local councils - negotiate disposal to landfill with affected landowners - may involve some free erosion prevention design work	$0					0.0%
CIV-03	Risk	All Lines	Temp access track functionality	Where weather dictates, CuString and/or Powerlink may direct the contractor to close roads until they dry out and work out of sequence.	Stand-down and/or additional crew mobilisation charges for clearing, piling, tower erection and stringing crews are likely if working out of planned sequence.	Identified no.xx locations along the alignment to access transmission corridor.	$0					0.0%
CIV-04	Risk	All Lines	Availability of public access roads	Council dirt roads shut down due to wet weather (boggy) or due to maintenance, repair or new project works	Stranded equipment, delay to program.	Various access points have been mapped along the route in case of any portion of route is inaccessible. Liaise with all council regions along the alignment to obtain maintenance programs to local roads and clarify against the access program.	$0					0.0%
CIV-05	Risk	All Lines	Provision for creek crossings on access roads	Uncertainty around allowances for works (and maintenance) at creek crossings to ensure all weather access including ballast placement, etc. Flood modelling required to determine civil works schedule at low lying locations (i.e. Hughenden to Cloncurry - 185km of floodplains) and temporary works design approval for waterway barrier crossings.	Non accessible areas.	Several treatment methods have been identified for water crossing and the cost factored in the estimate.	$0					0.0%
CIV-06	Risk	All Lines	ERSED controls/ allowances	Insufficient allowances for installing and maintaining ERSED controls including sed fences, runoff channels as per the RMS bluebook. Changes to schedule impacted by wet season, resulting in revised ERSED designs and additional works required.	Run offs to private properties.	Estimate reviewed for adequacy	$0					0.0%
CIV-10	Risk	All Lines	Batch plant reliability	Concrete batch plant break down or failure	Stand down of work crews and programme delays	Engage multiple local concrete suppliers. Establish on-site mobile concrete batch plants, stationary or portable Ensure suitable maintenance facilities are in place for preventative and responsive servicing with adequate stock of normal and critical spare parts are carried	$0					0.0%
CIV-100	Risk	All Lines	Visitor injury	Following causes including poor planning, poor housekeeping, poor training	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - site restriction imposed by temporary / permanent fencing - safety procedures adhered to for working in proximity to live equipment / plant / heavy equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards - adherence to JV policies and procedures, specifically for planning, PPE and audits	$0					0.0%
CIV-102	Risk	All Lines	Boundary limits	Location of boundary / existing facilities not as expected. This may mean that the layout will not fit in a greenfield area and more brownfield works required. Potential change in landowner access agreements through other properties.	Additional cost due to potential redesign and / or rework introducing delays to certain stages of the project	Treatments include: - complete dial before you dig at the early stages of the project - complete full Geotech / LIDAR surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans nearby	$0					0.0%
CIV-103	Risk	All Lines	Archaeological impacts	Possible occurrence of unknown archaeological deposits.	Cost of delay and standby	Treatments include: - JV must comply with Heritage Acts - no additional activities other than those planned to be undertaken - works must comply with AAPA (Australian Aboriginal Progressive Association) certification - complaints register maintained and updated (reports to JV / Powerlink)	$0					0.0%
CIV-104	Risk	All Lines	Accommodation (other than camps)	Cost of accommodation increases for the BC site staff	Budget overspend	Treatments include: - maximise local recruitment - use of subcontractors for some of the works - include sufficient contingency / options within the budget - increase the site of camps	$0					0.0%
CIV-105	Risk	All Lines	Disturbance to public traffic	Vehicle collision, pedestrian access	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - approved Traffic Management Plan (TMP) - competent traffic controllers - signage installed as per TMP - notification to surrounding community during disturbances - designated pedestrian access	$0					0.0%
CIV-107	Risk	All Lines	Use of chemicals - conduit glue, jointing compound	Skin irritation	Impacts include personal injury	Treatments include: - SDS / SWMS - appropriate PPE; Gloves, face mask in poorly ventilated areas - wash hands/skin after contact - report irritation - storage in appropriate chemical cabinet	$0					0.0%
CIV-108	Risk	All Lines	Existing fauna	Bites, injury, damages	Impacts include personal injury or death	Treatments include: - awareness - first aid kits in all areas (including vehicle) in prominent and clear positions - trained personnel - local fauna awareness - do not disturb habitats - reporting - check work areas - PPE	$0					0.0%
CIV-109	Risk	All Lines	Traffic breaching management plans, No Traffic Plan for designated area or greater numbers of traffic than detailed.	Traffic breaching management plans, No Traffic Plan for designated area or greater numbers of traffic than detailed.	Death or injury via traffic interactions, delays to project	From EIS Statement Vol 2 Chapter 13-3 - Traffic It is recommended that a traffic plan be supplied to Queensland Rail detailing the traffic volumes expected to traverse level rail crossings, the frequency and period of operation. This should include peak traffic volumes, such as daily workforce movements in addition to heavy, over dimensional vehicles that will cross rail structures including level crossings. Construction Contractor(s) to develop traffic management and road use plans, specific to phase and work fronts Traffic plan shall be submitted to Queensland Rail, detailing expected traffic volumes, frequency and period of operation Improving/implementing advanced warning and visibility of intersections through approach signage, reduced speed zones or chevrons Intersection may require widening for safe turning, additional investigations and a road safety audit shall be undertaken to determine the extent of widening works warranted.	$0					0.0%
CIV-11	Risk	All Lines	Concrete mix design and additives	Sensitivity around the concrete mix design in response to managing temperature, durability, etc. May need to qualify cement type and use of certain additives.	Cold joints during concrete pour resulting in rejection of pile.	Concrete delivery strategy based on maximum **60 + 10** minutes travel time. Identification of tower locations with > **60** min travel from existing concrete plants . Earmarking Mobile plant locations based on above. Admixtures approved by CuString for concrete mix design to increase maximum concrete placement time.	$0					0.0%
CIV-111	Risk	All Lines	No approvals to transport equipment or work near rail corridors	No approvals to transport equipment or work near rail corridors	Rail strike on personnel or equipment or near miss. Causing death or injury	Seek approval from railway managers via writing to undertake works with rail corridor or interfere with rail operations Dedicated planning around working near rail Suitable qualified personnel to work near rail Traffic controls in place when working near rail Hard barriers	$0					0.0%
CIV-113	Risk	All Lines	Legislation and Approvals	Development application approvals not received in time for waterway barrier works, clearing requirements for accommodation camps and temporary facilities not included in EIS, and submission and approval of MCU application for camps.	Impacts include: - Delay to program	Treatment includes: - Ensure assessment of development applications are included in the project schedule with conservative approval period duration to avoid schedule delays.	$0					0.0%
CIV-114	Opportunity	All Lines	Temp access track strategy/ optimisation	Opportunity to reduce the access track design by utilised small access roads (tee off from main road) compared with a temp full length "centre line" road. To include capping 50m either side of tower. Potential for access track over virgin ground based on high soil strength encountered and good weather. Potential to have bog mats available at various sections of the alignment where short distances of unsuitable or low soil strength is present to avoid import of material or access track construction costs, particularly in areas where suitable quarry gravels are not available.	Clearing under the wires is required for stringing with a minimum of tractor wide access.	Track clearing - 2 no's 4m wide is required for stringing the wires out of which one will be used for access as well.	$0			5%	10%	0.0%
CIV-16	Risk	All Lines	Supply concrete aggregates	Sensitivity around assumptions regarding aggregate supply. Quarry assumptions - yield, overburden, fines, etc	Erratic concrete supply	Prices for various quarry materials have been sought for transport to 29 stockpile locations along the alignment.	$0					0.0%

CIV-18	Risk	All Lines	Bushfires - JV caused	Damage to JV assets or assets for which JV is responsible, property (incl stock and crops) or environment (flora & fauna) or loss of life due to uncontrolled bush or grass fires caused by JV	Impacts include: - cost for delay - cost of remedial works - cost of compensation - cost of penalties - loss of reputation	Treatment includes: - prepare and implement an effective Wildfire (Bushfire) Management Plan along with SWMS - establish emergency contacts - where practicable, establish fire breaks around site boundaries and maintain regularly - regularly remove combustible rubbish from site e.g. packing crates and packaging - have appropriate fire fighting equipment available including backpacks and suitable water supply - where appropriate, equip vehicles with spark exhaust arrestors - implement effective staff training - establish regular monitoring & audit regime - establish effective insurance	$0					0.0%
CIV-19	Risk	All Lines	Unexpected finds Damage to Artefacts	Damage by JV to artefacts having cultural heritage value.	Impacts include: - cost for delay - cost of restoration - cost of avoidance (deviation)	Treatment includes: - qualify our tender to exclude costs for time and delay and any restoration or avoidance required. - JV must comply with Heritage Acts - complete adequate number and location(s) of non-intrusive investigations - works must comply with AAPA (Australian Aboriginal Progressive Association) certification - complaints register maintained and updated (reports to JV / TG) - implement effective staff training - establish effective insurance	$0					0.0%
CIV-20	Risk	All Lines	Damage to Artefacts at known site	Damage by JV to artefacts having cultural heritage value. Including the risk of unexpected finds - excluding damage - will cause delays and unexpected costs should resequencing need to occur or delay into wet season for civil works.	Impacts include: - cost for delay - cost of restoration - cost of penalties - loss of reputation	Treatment includes: - JV must comply with Heritage Acts - works must comply with AAPA (Australian Aboriginal Progressive Association) certification - implement a maintenance and security regime for protection of known artefacts - complaints register maintained and updated (reports to JV / TG) - implement effective staff training - establish effective insurance	$0					0.0%
CIV-24	Risk	All Lines	Excavation Rock vs OTR	Inconclusive Geotech - hard rock encountered. Insufficient geotechnical drilling completed at transmission line tower foundation locations.	Impacts include: - cost overrun - delay costs	Treatments include: - Perform additional targeted Geotech in suspected rocky areas - ensure access to plant with adequate capacity for the conditions - design a suite of foundation types for towers and substation structures from which one can be selected by the project engineer to suit the prevailing soil conditions - requires pre-drilling of a foundation leg to ascertain foundation type	$0					0.0%
CIV-32	Risk	All Lines	State wide fire bans	Hot work restrictions e.g. rebar cutting, earth welding, welding of busbars	Impacts include: - labour standby costs	Treatments include: - assign labour to alternative duties	$0					0.0%
CIV-33	Risk	All Lines	Topsoil management/ reinstatement	Stockpiles in windrows - Return to condition we found it in or impact of storm event	Impacts include: - difficult landowner requires unreasonable restoration costs - access delays result in demob/remob costs - Insufficient topsoil from loss or rock contamination - needs screening and/or replenishment costs	Treatments include: - conduct dilapidation survey of condition as found - effectively engage with landowners in accordance with Community and Stakeholder Management Plan - negotiate soil replenishment from local borrow pit at no/minimal cost - comply with the CEMP requirements including arrange and maintaining appropriate silt fencing to prevent loss of soil	$0					0.0%
CIV-34	Risk	All Lines	Excess Topsoil	Excess topsoil to be removed off site in accordance with CuString spec.	Impacts include: - potential to deliver topsoil to local councils or landowners saving the project long hauls and potential disposal costs. - stockpile and make up any losses experienced for localised transmission line tower access road and platform restoration	Treatments include: - negotiate retention of topsoil to create earthen berms and plantings for screening of the substations - value add for which we should get paid. - early engagement with landowners in order to organise enviro approvals in time.	$0					0.0%
CIV-35	Risk	All Lines	3rd party buried services strike	3rd party buried services could be damaged during excavation	Impacts include: - standby of labour and plant - consequential loss liability - cost of repair up to value of insurance excess - loss of reputation	Treatments include: - complete dial before you dig at the early stages of the project - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans for nearby areas - hand dig to uncover any located services	$0					0.0%
CIV-36	Risk	All Lines	Disposal of piling spoil	Client spec allows majority of the pile spoil to remain on site and be spread over the pad at completion of works.	Spoil at locations of cultivated land will likely have to be disposed of off-site	- Examine satellite photos to identify cultivated pastures and allow to dispose spoil into landfill	$0					0.0%
CIV-39	Risk	All Lines	Existing services within existing areas (farms etc)	Existing water, gas, electricity supplies to be considered	Impacts include: - standby of labour and plant - consequential loss liability - cost of repair up to value of insurance excess - loss of reputation	Treatments include: - complete dial before you dig at the early stages of the project, if available or conduct detailed analysis with land owners - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans for nearby areas - hand dig to uncover any located services	$0					0.0%
CIV-40	Risk	All Lines	Remediation to benching	Areas and landowner agreements to be considered	Impacts include: - Delay to program - Increased remediation costs - Non compliance with environmental standards / landowner expectations	Treatments include: - negotiate with landowners on remediation expectations	$0					0.0%
CIV-41	Risk	All Lines	Biodiversity details to be determined	Wash down areas (weed and seed considerations) under the EIS state between all properties	Impacts include: - Increased costs for mobile washdown facilities between properties - Risk of non-compliance	Treatments include: - negotiate with landowners - detailed analysis on weed types/location and make provisions for washdown where weeds are located to reduce risk of spreading across adjoining properties	$0					0.0%
CIV-44	Risk	All Lines	Remote locations - equipment	Use of helicopters to be used for delivery purposes in restricted access or remote areas - particularly between Cloncurry and Mt Isa and between Hughenden and Cloncurry (Julia Creek / floodplain region)	Impacts include: - Delay to program - Increased costs for material supply and logistics	Treatments include: - Access routes to be detailed during ECI to determine areas not accessible using conventional road methods. - Cost allowance in ECI for use of helicopters for delivery in remote/access restricted areas .	$0					0.0%
CIV-45	Risk	All Lines	Damage to Private Roads / Accesses / Property Fencing and Assets	Damage to existing private roads / accesses / fences / property due to deliveries of plant, equipment and materials resulting in rectification works.	Impacts include: - Residual cost to repair damages - Loss in reputation	Treatment includes: - JV must comply with Traffic Management Plan - Analysis during ECI on private road furniture that will be impacted by the alignment to allow for rectification cost and time to be included in submission - complaints register maintained and updated (reports to JV / Powerlink) - implement effective staff training - establish effective insurance	$0					0.0%
CIV-46	Risk	All Lines	Exceeding Construction Water Allowance	Utilising more of underground water reserves than originally anticipated - particularly in drought affected regions may compromise project reputation	Impacts include: - Cost to install additional water bores / obtain permits/licences - Loss in reputation	Treatments include: - investigate availability of sufficient suitable free standing water at proposed locations of batch plants at time of tender - in the absence of free standing water, investigate availability of bore water and required license to use at proposed locations include in estimate	$0					0.0%
CIV-48	Risk	All Lines	Weed Treatment and Management	Weed spray in advance of clearing works - insufficient to complete weed eradication in advance of clearing works - impacts due to wet weather or inefficiency	Impacts include: - Delay to program - Risk of spreading weeds across properties	Treatments include: - ensure weed survey undertaken during ECI and weed spray allowance for both cost, time and productivity is adequately resourced to meet civil works commencement. - liaise with landowners on weed eradication program	$0					0.0%
CIV-49	Risk	All Lines	Mulch Generation	Inadequate analysis during tender of mulch generation during clearing works, particularly in heavily vegetated areas. Increased costs to remove from site if volumes exceed uses for Type 2 control ERSED management within alignment. EIS states that all material cleared along alignment will be chipped, mulched and stockpiled.	Impacts include: - Delay to program - Increased costs in management, removal and disposal of excess mulch	Treatments include: - ensure mulch assessment is completed during ECI to ensure adequate analysis on volumes generated and requirements for disposal, if required by the Client.. - liaise with landowners on mulch storage on properties to avoid disposal fees - liaise with local councils/waste disposal/landscaping companies on cost efficient removal of excess mulch from site.	$0					0.0%
CIV-54	Risk	All Lines	Landowner Agreements	Agreements with local planning authority / locals / stakeholders prior to site establishment being inadequate or incomplete.	Delay to build / installation activities resulting in additional consultation with stakeholders	Treatments include: - conducting detailed landowner engagement during ECI to determine expectations - Meet with local planning authorities and stakeholders during ECI	$0					0.0%
CIV-56	Risk	All Lines	Plant and Equipment movements	Interface with local area and private property for traversing plant over local roads etc	Impacts include: - Potential delay to program if suitable negotiation / expectations are aligned during ECI - Increased costs	Treatments include: - conducting detailed landowner engagement during ECI to determine expectations - Meet with local planning authorities and stakeholders during ECI	$0					0.0%
CIV-57	Risk	All Lines	Remote locations - communication	Communication blackspots (TBC - locations) - Selwyn and Woodstock particularly	Impacts include: - Safety risk for personnel in field working in black spots, emergency response management plan - Increased costs to rectify black spots / additional satellite phones for staff and workforce, as required.	Treatments include: - additional Satellite Phones - low cost and readily available just needs planning $500/phone plus $30/mth subscription fee per phone - Emergency response management plan to address black spot communication areas and mitigation measures.	$0					0.0%
CIV-58	Risk	All Lines	Transport to / from sites losing comms	Journey management plans - travel tracking systems	Impacts include: - Safety risk for personnel travelling along alignment - Increased costs	Treatments include: - additional Satellite Phones - low cost and readily available just needs planning $500/phone plus $30/mth subscription fee per phone - Emergency response management plan and journey management plans to address black spot communication areas and mitigation measures.	$0					0.0%
CIV-60	Risk	All Works	Plant breakdown	Breakdown of JV assets (or a 3rd party for which JV is responsible) e.g. mobile cranes, winches, telehandlers, cherry pickers	Cost of delay and standby	Treatment includes: - initial condition audit and repairs before mobilisation - establish a planned routine and responsive maintenance facility with adequate stocks of standard and critical spare parts - ensure all items of plant and equipment have instruction and maintenance manuals - conduct adequate operator training and ensure appropriate licenses are in place	$0					0.0%
CIV-61	Risk	All Lines	Rework - quality control	Poor quality work including earth welding, cable support systems, cable terminations, interpanel wiring, grouting, HV conductor installation/crimping, poor adherence to drawings.	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - implement effective recruitment that validates previous experience/performance - implement effective quality assurance - implement effective training - apply effective supervision	$0					0.0%
CIV-65	Risk	All Lines	Out of hours, outdoor working not permitted (within EIS)	Construction hours are specified between 630am to 630pm Monday to Saturday - no Sunday works or out of hours works permitted, due to planning noise constraints for example, caused by working noise, traffic movements outside normal construction hours. Heavy vehicle entry restricted during these times for all deliveries.	Impacts include: - Residents / local complaints could lead to stop notice delays. - non conformance with EIS and project rules - Quality control of concrete during high temperatures if not permitted outside of working hours. - Extends duration of program losing all works on Sunday which impacts on both cost and time savings. - Logistics of coordinating all heavy vehicle deliveries within site permitted hours could restrict works on site	Treatments include: - agree extended hours with early contract negotiations with Powerlink for specific tasks (night shifts will be required during pre-commissioning) - plan ahead and early - increase working groups / resources during normal construction hours (accelerate)	$0					0.0%

CIV-67	Risk	All Lines	Performance testing (noise) at project end - compliance with EIS	Noise from operating plant exceeding Powerlink / EIS constraints.	Additional design, materials and labour to rework, correct and / or replace equipment	Treatments include: - replace equipment causing the issue - install noise barriers - ensure suppliers are onboard with EIS compliance and have tested successfully via FAT	$0					0.0%
CIV-68	Risk	All Lines	Stakeholder reputation due to high profile project	Stakeholder reputation causing disruption to local residents if the project delivery runs later than anticipated, as this will be a very visible project in Australia (e.g. first power in SA).	Reputation of JV and Powerlink within the HV community and worldwide	Treatments include: - employ external marketing company to manage stakeholder reputation / expectations - continued dialogue with Powerlink during all facets of the project to provide third party continued free-flowing communication to all stakeholders	$0					0.0%
CIV-74	Risk	All Lines	Buried service strike	Unknown / known buried services maybe damaged and / or require replacement / diversion.	Additional, unplanned activities resulting in programme delays and additional construction costs	Treatments include: - complete dial before you dig at the early stages of the project - complete full Geotech / LIDAR surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans for nearby areas	$0					0.0%
CIV-76	Risk	All Works	Plant, product and equipment delivery	Out of sequence deliveries and multiple work faces standing idle due to the unavailability of equipment, products or plant.	Quality of products not as required due to suppliers trying to get back on track with late manufacturing cycles	Treatments include: - continued dialogue with suppliers during manufacture - adequate commercial terms with suppliers to ensure timely delivery - JV staff in attendance during manufacture and FAT	$0					0.0%
CIV-78	Risk	All Lines	Unknown pandemic and / or restrictions to site access by national / state government e.g. COVID, bird flu, foot & mouth, blue tongue, anti-terrorism measures etc.	Unforeseen delays caused resulting in lack of site access / minimal resource availability.	Interruption to planned sequencing and ultimately delays to the overall project programme.	Treatments include: - ensure Powerlink contract excludes responsibility and allows for such 'unplannable' (force majeure) events	$0					0.0%
CIV-79	Risk	All Lines	Damage to existing / old equipment during construction / pre-commissioning	Damage to existing equipment and / or systems	System unable to operate adequately, potential blackout	Treatments include: - ensure that all existing equipment is identified along with any potential unknown events - where possible provide spares / replacement parts for critical components, including long lead items - provision of adequate training and / or staff	$0					0.0%
CIV-83	Risk	All Lines	Archaeological finds	Restrictions and disruptions imposed	Programme delays and re-sequencing of key construction activities.	Treatments include: - complete full Geotech / artefact surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans nearby - check local history of plant / building use nearby and / or in situ	$0					0.0%
CIV-84	Risk	All works	Industrial action	Industrial action excluding JV staff	Access delays, danger to staff, delays to programme.	Treatments include: - continued liaison with locals / Powerlink - regular community updates - employment of locals during the project duration to create buy-in	$0					0.0%
CIV-85	Risk	All Lines	Emergency return to service (ERTS) implementation	Additional costs for implementing ERTS or providing contingency support and acceleration measures.	Increase in costs and re-sequencing issues.	Treatments include: - continued discussion during commissioning meetings to book sufficient and adequate outages well in advance of the requirement to maintain the project programme	$0					0.0%
CIV-87	Risk	All Lines	Uninsured losses	Uninsured losses resulting from a defect after the cover for such losses has expired.	Additional costs.	Treatments include: - ensure adequate cover and or provide sufficient provision or contingency to cater for such uninsured periods	$0					0.0%
CIV-88	Risk	All Lines	Road / building collapse (move to civil)	Collapse during excavation activities	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - dial before you dig - Geotech completion in all locations - trial holes - use of current drawings / as-builts - preliminary site surveys	$0					0.0%
CIV-89	Risk	All Lines	Unmarked excavation	Worker / equipment falls into excavation	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - JV safety procedures adhered to for excavation and identification - JV safety procedures adhered to for working in proximity to excavations - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards - site hazard board to be updated daily to reflect current work / areas	$0					0.0%
CIV-90	Risk	All Lines	Traffic accident	Incident / accident within the site and / or entering or leaving site	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - provide separate entry / egress points to the site - work to traffic management plan - clearly labelled pathways and traffic access points - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to traffic - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0					0.0%
CIV-92	Risk	All works	Management structure	Unclear roles and responsibilities	Injury, fatality, prosecution by WorkSafe	Treatments include: - adherence to JV recruiting policies and procedures - clearly communicated organisation chart - job descriptions in place for all roles with regular review - regular team meetings in combination with pre-start / toolbox meetings - clear dialogue between site teams and head office	$0					0.0%
CIV-94	Risk	All Lines	Dust complaint	Construction dust impacting local residents, impacting operation of existing / new equipment	EPA intervention, JV / Powerlink fined, reported in news media impacting on reputation	Treatments include: - regular dust monitoring and suppression - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0					0.0%
CIV-96	Risk	All Lines	Damage to contractor assets	Damage to assets, including 3rd party assets that the JV is responsible for due to any of the following: - Fire, collapse, flooding, explosion, impact - Terrorist activity, demonstration, sabotage - Whilst in storage - Whilst in transit	Cost of delay and standby	Treatments include: - include sufficient contingency within the project schedule and budget - use of competent transport company - complete asset register available at short notice for equipment replacement	$0					0.0%
CIV-97	Risk	All Lines	Unions	Union issues with labour (especially out of state labour)	Cost of delay and standby	Treatments include: - implementation of robust EBA scheme - early recruitment of key staff positions - adherence to JV recruitment policy and procedures - regular community updates - employment of locals during the project duration to create buy-in	$0					0.0%
CIV-98	Risk	All works	Injury / illness of workers	JV employees (or a 3rd party for which JV is responsible) are impacted by injuries / illnesses relating to: - Material handling, mechanical / plant equipment, repetitive strain injury, etc - Hazardous substances, physical or biological agents - Legionnaires disease, epidemic or pandemic disease - Risk of abuse, threats, acts of violence (including being taken hostage, robbery, kidnap& ransom)	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to live equipment / plant / heavy equipment - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards - UTake5 system maintained for minor method changes	$0					0.0%
COM-01	Risk	All works	Commercial conditions - L.D.'s, time bars etc.	Risk that the project is not finished by the PA date, caused by delays in JV control and delays outside JV control which do not provide for EoT. (SRA to address any time related risk)	Liquidated Damages being incurred ($xxxk per day) and subsequent direct and indirect costs incurred. Additional costs incurred as a result of acceleration to avoid LD's.	SRA Analysis conducted. Seek early award / access to key areas, mobilisation of additional resources during completions / commissioning. Maximise program opportunities during the construction of the works. Acceleration measures - additional resources, increase working ours, resequencing of the works. LD penalties not expected.	$0					0.0%
COM-02	Risk	All works	Cashflow	Inadequate cashflow management results in cash negative position.	Interest charges incurred. Flow on effect to subcontractor payments - Insolvency of subcontractors.	Negotiation of favourable payment terms. Designated Finance Manager (Close management of cashflow position). Cashflow calculation carried in estimate.	$0					0.0%
COM-03	Risk	All works	Client payment delays	Payment delays result in negative cash position for D&C	Late approval of claims. Negative impact on project cash-flow. Interest charges incurred.	Contract sets out payment terms (Refer Deed clause xx) to certify progress payment, paid x days from issue of certificate, max duration between claim and payment of xx Business days (except for disputed amounts). Variations to be submitted and agreed as project proceeds. Maintain sufficient cash reserves in project to cover underclaim. Request up-front payment.	$0					0.0%
COM-07	Risk	All works	Security Provisions -Insurance Bond Rate	Potential to attract a reduced rate for the provision of Insurance Bonds through negotiation.	Lower interest is paid on Insurance Bond	Look at alternate strategies with JV corporate to obtain competitive rates for Insurance Bond provisions.	$0					0.0%
COM-08	Risk	All works	Security Provisions - Bond for P&E and Unfixed Goods Upfront Payment	Requirement to extend the duration of the up-front payment bond (to be returned upon delivery to site)	Higher bonding costs incurred.	Full time commercial manager and finance team included in staff.	$0					0.0%
COM-14	Risk	All works	AAIP & QPP Penalty for non-local industry participation	AAIP & QPP will impose a significant penalty on contract payments if local purchasing falls below target or committed %.	Financial penalty applied.	Detailed procurement lists developed and importation penalty applied where applicable. Potential to engage local companies to import on our behalf.	$0					0.0%
COM-20	Risk	All works	Supplier Payment Terms	Negotiations with major suppliers and subcontractors fails to secure payment terms consistent with D&C / SPC payment terms	D&C Contractor has to fund the difference	D&C Contractor to agree a payment process that results in the shortest time possible from the EOM. Submit the payment claim to SPV in last 1/3 of month for work up to the end of month	$0					0.0%
COM-21	Risk	All works	Late Payments to suppliers	D&C are delayed in the invoice payments to contractors, suppliers and consultants.	Claims from consultants, subcontractors and suppliers include for payment of interest on late payments.	Set up supply chain financing to ensure approved payments and made on time.	$0					0.0%
COM-22	Risk	All works	Additional Defects Bank Guarantee	D&C does not rectify defects before the expiry of the initial defects period and is required to provide additional bank guarantee up to 120% of the value of the rectification	Additional bonds are required	Rectify defects	$0					0.0%
COM-24	Risk	All works	Warranty Periods	Suppliers do not provide a warranty period which will protect the D&C JV from incurring costs in the event that a defect arises during the defect rectification period	D&C Contractor is required to pay the supplier to rectify equipment which is outside the warranty period	Negotiate back to back warranty for major plant and equipment such as HV power and instrument transformers, HV reactors, HV switchgear and qualify if this is not possible. Note that this will need to be resolved before tender submission.	$0					0.0%
COM-25	Risk	All works	Sub consultancy Agreements	The subconsultants do not agree to back to back provisions in the consultancy services agreements; risks with the gap is left with the D&C JV ; Cap on Liability, exclusions and carve outs to loss/damage, indemnities, etc	D&C JV are not able to pass on claims to subconsultants	Ensure back to back agreements are negotiated with Subconsultants	$0					0.0%

COM-26	Risk	All works	Construction Bonds	The D&C Subcontractor is required to replace any undrawn amount of a Construction Bond within a specified period of the issuer of the Construction Bond ceasing to have the Required Rating	Replacement of construction bonds with (A) A- (S&P) or higher; and (B) A3 (Moody's) or higher, whose fee is higher than previous provider	Use reputable and reliable bond providers	$0					0.0%
COM-27	Risk	All works	Defects	The D&C Subcontractor is required to replace any undrawn amount of a Construction Bond within a specified period of the issuer of the Construction Bond ceasing to have the Required Rating (with the actual period dependent upon the revised credit rating of the issuer (less time for major downgrades)).	D&C is required to purchase constructions bonds at a higher premium	Ensure DD is undertaken on issuers of the construction bonds to ensure they are not at jeopardy of being downgraded	$0					0.0%
COM-28	Risk	All works	Termination	CuString voluntarily terminates the agreement and the D&C Contractor's valuation of the termination payment exceeds the cap included in the Contract.	D&C is required to submit a claim for a termination payment however the valuation of the payment exceeds the cap and it is unable to recover its costs incurred to date for the project.	D&C to size the cap in the bid to ensure that under a worst case scenario, it is able to recover its costs for the project.	$0					0.0%
COM-30	Risk	All works	Theft	Theft of JV assets (or a 3rd party for which JV is responsible) due to any of the following: - Assets, Computer/Data, records, Money, Staff property - Identity theft	Cost of excess not recoverable from insurance claim and for delay and/or standby of labour and plant resources	Treatment as follows: - Implement effective insurance policies - Implement effective site security plan, including roving patrols, security systems, fire management plans	$0					0.0%
COM-31	Risk	All works	Intellectual Property breach	Intellectual property risk related to: - Stolen IP, breach of copyright - Fraudulent or unapproved use of trademarks, brand names or logos	Loss of competitiveness and cost for pursuing legal redress	Treatment as follows: - implement effective subcontractor and consultant selection and protective measures in subcontract and consultancy agreements - carefully monitor disclosure of IP - focus on self-performance of design activities	$0					0.0%
COM-32	Risk	All works	Strategic Consistency	JV suffers difficulties in communicating or controlling remote locations and/or multiple sites	Consequences include: - cost for delay & standby - poor productivity - poor quality - poor reputation	Treatment as follows: - effective workload planning - effective resource planning and related training - effective communications	$0					0.0%
COM-33	Risk	All works	Damage to 3rd party assets	Damage could be caused to a 3rd party as a result of: - Products/services supplied by JV - Misleading/deceptive or negligent advice	Consequences include: - liability for loss up to the value of the excess - liability for rectification - cost of delay - loss of reputation	Treatment as follows: - implement effective insurance policies - implement effective design constructability reviews - implement effective construction planning, SWMS and subcontract supervision	$0					0.0%
COM-34	Risk	All works	Suppliers	Failing to negotiate commercial contracts effectively such as: - Permits - Consultancy and subcontract agreements - Purchasing arrangements	Consequences include: - legal costs - liability for damages - contractual claim - cost of delay	Treatment as follows: - effective vetting of prospective suppliers - preferred supplier status - implement effective subcontract/consultancy/procurement agreements	$0					0.0%
COM-35	Risk	All works	Breach of contract	Breach of contract resulting in an interruption to JV operations and/or performance from external parties including suppliers and customer	Consequences include: - legal costs - liability for damages - contractual claim - cost of delay	Implement effective contract administration (monitoring/controls)	$0					0.0%
COM-36	Risk	All works	Cost Escalation	Labour cost increase associated with large direct employed workforce	Large multi-state project attracts unplanned Site Allowance and/or unplanned larger or more frequent hourly rate increases which result in cost overruns	Treatment as follows: - Negotiate a greenfields Site Agreement before tender submission - Benchmark labour rates and allowances against other similar projects during tender e.g. HumeLink	$0					0.0%
COM-38	Risk	All works	Breaching Legislation	Breaching JV obligations for employment law due to poor IR planning or compliance with a Site Agreement and consideration for IR Best Practices Conditions.	Cost for delay and standby	Treatment includes: - prepare and implement an IR Management Plan - negotiate a workable Site Agreement - ensure applicable staff are appropriately qualified and trained	$0					0.0%
COM-39	Risk	All works	IS/IT failure	Failure of service links i.e. telecommunications, connectivity etc results in poor communications with head office thereby adversely affecting large project reporting requirements for publicly listed company	Impacts include: - cost of delay - ASIC issues - loss of reputation and decline in CIMIC stock price	Develop contingency plan for rapid deployment of a back-up service	$0					0.0%
COM-40	Risk	All works	Supplier variations	Failure of the JV to adequately scope the nature and quantum of supply for subcontracted works or major HV plant items or misunderstanding by the supplier/subcontractor of the specified scope	Impacts include: - dispute - cost of variation claims - delay costs	Treatment as follows: - effective vetting of prospective suppliers - preferred supplier status - implement effective subcontract/consultancy/procurement agreements - ensure alignment on the specified requirements	$0					0.0%
ENG-04	Risk	All works	Mobilisation delays	Delays to mobilising the design team (incl. engineers and drafters) and concluding agreements with external consultants and suppliers of major plant items for which design is required	Impacts include: - Delays to design, supply of equipment - Commercial impediments to engage suppliers to incorporate into designs	Treatments include: - Identification during the ECI phase of additional external design resources that would be required for the EPC phase of the project - Early engagement during the ECI phase of design consultants with adequate resources, experience in design and construct contracts, and understanding of the need to meet design programs - Preparation and pre-agreement of commercial terms of engagement with suitable design consultants	$0					0.0%
ENG-05	Risk	All works	Design cost overrun	Re-design due to changed conditions, redesigns, interface/ brownfield issues, approval issues, procurement involvement, third party requirements, and construction/ constructability feedback	Impacts include: - Design cost increase	Treatments include: - Price to Design scope with list of clarifications/exclusions/assumptions - Capable and experienced Design Managers appointed to maintain and track design actuals against budget. - Design changes required due to changed conditions, redesigns, interface/ brownfield issues, approval issues, procurement involvement, third party requirements, and construction/ constructability to be managed via the Change Management Process	$0					0.0%
ENG-12	Risk	All works	TXL Foundations Growth	Transmission Line foundation quantities vary due to: - rebar qtys - pile diameter, undercut design - durability issues, corrosion due to circulating currents including induction from adjacent feeders - QA of embedment meeting design requirements - casings - load cases inputs - testing requirements	Impacts include: - Increased design costs - Increase in construction costs - Increase in project durations - Increased requirement for manning and P&E	Treatments include: - Engagement of an experienced Design Managers who fully understands the design constraints, design sequencing and timing requirements - Design leads and teams to understand the basis of the estimate and design to the estimate - Identify critical packages (e.g. foundation concrete, foundation steel, earthworks cut/fill, tower steel mass) to be tracked through the design process and reviewed against estimate at each design review - Designers to continue to develop cost saving alternatives (either in materials quantities or time related savings) where possible to reduce growth - Design Manager and Design Leads to follow Change Management Process when change occurs	$0					0.0%
ENG-15	Risk	All Lines	TXL crossings (above existing infrastructure)	Increased design due to transmission lines crossings: - hurdle requirements (temporary works) - third party requirements - electrical infrastructure crossings may not be permitted - lack of existing infrastructure information	Impacts include: - Design rework - Increased design costs - Site construction constraints with regards to permits, stakeholder management	Treatments include: - Review the map layers on CuS GIS system and assess the crossings data - Liaise early and directly with Ergon and other asset owners for information including line schedules and any available plan and profile drawings - Lidar investigations to identify existing transmission and distribution lines (including heights) - Construction team to audit/carry out site/route survey ahead of time and feedback any information to design - Design new transmission lines to avoid double circuit crossings	$0					0.0%
ENG-18	Risk	All Lines	TXL corona and noise	Transmission Line conductor change due to: - corona and noise (audible and RIV) issues - 330kV lines - corona and noise (audible and RIV) issues - 220kV lines - conductor bundle may result in performance issues - greasing requirements - sand blasting requirements - specular conductor - sag assumptions - MVA limitations	Impacts include: - re-design of towers due to conductor change - increased conductor costs	Treatments include: - Carry out corona and noise studies for each conductor type early in the design process	$0					0.0%
ENG-19	Risk/ Opp	All works	Owner's engineers	Owner's engineers non-acceptance of designs - creates additional design review and approval burdens/hurdles - delays in review feedback/comments - pedantic/preferential comments/feedback - non-consolidated feedback or reiterative design review feedback - changes to design specification (beyond base scope requirements) - approvals process goes around in circles	Impacts include: - Delays to design - Design rework - Changed specifications and performance - Delays to construction works - Increased project costs	Treatments include: - Identify key design milestones in program, allow appropriate time for design review, verify with CuS and other review stakeholders - Ensure design review periods and design review process clearly articulated in the PPR and/or Design Management Plan - Hold design review workshops to review designs and close out review comments for each design package - Maintain design review comments registers to track and close out all review comments	$0					0.0%
ENG-21	Risk	All works	Customer interfaces	Remote ends/existing customer interfaces: - lack of customer end information - customer collaboration/willingness to share information - customer interruptions/outages - tie-in/cut-in staging complexities (e.g. Mt. Isa) - fault levels - existing services	Additional CuS works to accommodate customers, alignment with CuS to ensure supply	Treatments include: - Clear Division of Responsibility document prepared as part of ECI - Ensure clarity on battery limits/termination points - Ensure each customer connection agreement provides sufficient information on battery limits/terminal points and DoR - Customer connection agreements to include RFI process including response durations	$0					0.0%
ENG-23	Risk	All works	Noise levels at substations	Shunt reactors, transformers and reactive equipment noise impact on nearest receptors.	Impacts include: - Disruption to receptors - Exceeds environmental limits - Additional costs for noise mitigation	Treatments include: - Identification of near noise receptors - Preliminary desktop noise studies to identify near receptors and potential noise mitigation measures - Allowance for future provisions of noise walls - Pre- and post-construction noise measurements to determine compliance requirements	$0					0.0%
ENG-27	Risk	All works	Communication systems performance	Communication systems does not meet performance requirements or operates at a degraded level - i.e. if no redundant path, loss of a CEV Hut	Impacts include: - Loss of system communication - Decreased system reliability	Treatments include: - Investigate alternative fibre technology to reduce the number of CEV huts - Duplication of critical system elements to provide redundancy	$0					0.0%
ENG-30	Risk	All works	Reliability	Unacceptable reliability outcomes	Impacts include: - Design rework - Increased equipment costs - Increased substation footprint size	Treatments include: - High level reliability studies at ECI stage to assess potential of the proposed system to meet reliability/availability targets - Sensitivity analysis (add remove/relocate equipment) to determine impact on availability - Design to consider availability - Seek availability data from OEM suppliers - Ensure customer connection agreements consider availability - Develop strategic maintenance and spares plan	$0					0.0%

ENG-31	Risk	All works	Spares	Required spares unknown at ECI stage. Required to be defined so that system reliability targets are met, and suitable O&M facilities can be provided.	Impacts include: - Under or over-specified O&M facilities for storage of spares - Insufficient spares to maintain system availability targets	Treatments include: - High level reliability studies at ECI stage to assess potential of the proposed system to meet reliability/availability targets - Sensitivity analysis (add remove/relocate equipment) to determine impact on availability - Design to consider availability - Seek availability data from OEM suppliers - Ensure customer connection agreements consider availability - Develop strategic maintenance and spares plan	$0					0.0%
ENG-32	Risk	All works	Chemical aggressivity of soil	Chemical aggressivity of soil impacts foundation design Insufficient geotechnical testing at ECI phase	Impacts include: - Design re-work - Increased foundation costs due to increased cover/increased concrete grade	Treatments include: - Increased frequency of geotechnical testing in areas identified as high risk for chemical aggressivity - Geotechnical investigations to include chemical analysis of samples - Results from chemical analysis to be considered in detailed design of foundations	$0					0.0%
ENG-35	Risk	All works	Design overspecification	Adherence to PLQ specs which may be over specified that leads to no benefits to reliability but adds to costs.	Impacts include: - Increased construction costs	Treatments include: - Design team to fully understand the required design specifications with PLQ specifications used as a baseline - Carry out optimisation, innovation and value engineering as part of the design process - Ensure departures from any onerous PLQ specifications are incorporated into the PPR	$0					0.0%
FIN-03	Risk	All works	Accounts Payable	Subcontractor (Supply and install contract) payments not processed within QLD SOPA payment terms.	Subcontractor Submits claim under the SOPA taking the CPBUGL JV to Arbitration - reputational damage, results in additional cost not included in forecast		$0					0.0%
FIN-04	Risk	All works	Accounts Payable	Minor supplier invoices not paid due to CPBUGL JV centralised shared services fails to detect/rejects invoices submitted.	Poor internal controls over supplier invoices results in missed payments, missed accruals and poor forecast		$0					0.0%
FIN-06	Risk	All works	Accounts Payable	Conflict of interest between site personnel and local contractors	Inflated subcontractor prices and payments made for work not done.		$0					0.0%
FIN-07	Risk	All works	Accounts Payable	Significant subcontractor invoices not accrued/included in forecast	Forecast costs understated resulting in lost margin		$0					0.0%
FIN-08	Risk	All works	Accounts Payable	Internal fraud within CPBUGL JV/lack of audit trail	inflated costs and loss of profit.		$0					0.0%
FIN-09	Risk	All works	Accounts Receivable	Client holds back/does not make payment of CPBUGL JV invoice	Negative impact of cashflow - CPBUGL JV unable to pay supplier/subcontractors	Monitor aging of debtors	$0					0.0%
FIN-12	Risk	All works	Data Security	Accidental sharing of data			$0					0.0%
FIN-13	Risk	All works	Data Security	Employee data theft			$0					0.0%
FIN-14	Risk	All works	Data Security	Software virus/phasing emails/external hacking			$0					0.0%
FIN-15	Risk	All works	Data Security	Hardware theft			$0					0.0%
FIN-16	Risk	All works	Asset Management	Poor tracking of assets	Assets are lost, transferred to other projects with no record or taken by staff at the end of a project.		$0					0.0%
FIN-18	Risk	All works	IT availability & reliability	Telecommunication and internet connection failure results in CPBUGL JV unable to communicate with subcontracts/suppliers and head office. Project experiences delays in programme and reporting	Cost over runs, reputational damage		$0					0.0%
FIN-19	Risk	All works	Credit risk	Subcontractor goes into liquidation and not able to complete contract	Cost impact, delays to schedule as need to go find another subcontractor to complete work.	Credit assessment, review of financial position during course of contract.	$0					0.0%
HRIR-01	Risk	All works	Camp standards	Issues relating to the standard of the camp accommodation including: - general facilities not good enough (rooms and recreational) - food quality - cleanliness - acceptance of modelling strategy (vs dedicated room)	Impacts include: - industrial action - high turnover of staff and labour resulting in higher recruitment costs, cost of delay and poor quality work - loss of morale and arise of work cultural problems - loss of reputation	Treatments include: - Allow for a very high standard of camp facilities - Selection of service provider subject of a rigorous process, including reference checking - Conduct regular surveys on camp performance undertaken by workers - implement any changes to offset any undesirable trends - Ensure suitable termination clause applies to contract based on poor performance - Ensure backup camp facilities are available	$0					0.0%
HRIR-02	Risk	All works	Camp capacity insufficient Room numbers	• Labour peaking underestimated and camp accommodation is insufficient • Locals vs non locals underestimated	Impacts include: - Cost of establishment of new camp(s) - Alternative accommodation (motels) - Program slip	Treatments include: - accommodation supply contract to include negotiated rates for ramp-up and/or additional workers plus guaranteed delivery time - Locate Substation construction teams in township accommodation	$0					0.0%
HRIR-03	Risk	All works	Camp man-days under- estimated	Increase (or decrease) in costs resulting from deviation in the base estimate percentage to be accommodated in camps Local vs non local	Impact includes cost overrun	Treatments include: - maximise local recruitment - use of subcontractors for some selected works	$0					0.0%
HRIR-05	Risk		COVID - Quarantine requirements	Employees requiring to isolate due to a close contact with an infected person. Could result in an entire crew being isolated	Impacts include: - Reduced productivity causing a delay in the program - Additional cost in standdown and potential quarantine requirements	treatments include: - Employees not allowed to mobilise if they have been in a high risk area or government named COVID hotspot - Employees reminded to report when feeling unwell and to isolate and have a COVID test - Monitor COVID vacancies and align with employment medicals - Encourage staff to remain in area on RnR	$0					0.0%
HRIR-07	Risk	All works	FIFO flight delays	FIFO workforce travel to site delayed due to issues with flights such as weather, mechanical issues, etc	Impacts include: - Lost time and resultant program delays	Treatments include: - engage reputable/ reliable charter flight operators with suitably sized fleets - allow some program contingency	$0					0.0%
HRIR-08	Risk	All works	Covid impacts	Unforeseen delays caused by restrictions to site access by national / state government e.g. COVID-19, bird flu, foot & mouth, blue tongue, anti-terrorism measures etc.	Impacts include: - delay costs - standby of labour and plant - out of validity induced material/equipment price rises	Treatments include: - Engage local labour first - Engage labour from the region second - Engage labour from the state third - Interstate labour last resort - Monitor COVID vacancies and align with employment medicals - Encourage staff to remain in area on RnR or option to relocate	$0					0.0%
HRIR-10	Risk	All works	Project Agreement delayed by Unions	Delay in negotiating and ratifying the project Site Agreement	Impacts include: - delay cost - disruption costs due to union militancy - reputational damage	Treatments include: - commence and conclude negotiations with employees and the union(s) for a Site Agreement before project award date i.e. during the early works activities performed under the Commitment Deed - negotiate a 'greenfields' Site Agreement with employees directly before contract award	$0					0.0%
HRIR-11	Risk	All works	Enterprise Agreement expiring during construction	Enterprise Agreement expiring during construction	Impacts include: - Increased costs - Delays & disruptions for negotiation meetings - Potential stoppages	Treatments include: - Ensure respective JV partners have a current Enterprise Agreement in place to cover the duration of the work; - Where an Agreement is due to expire during the contract, ensure a replacement Agreement is in in place before expiry securing the work from protected industrial action	$0					0.0%
HRIR-12	Risk	All works	Union Demarcation dispute	Union demarcation dispute between the AWU and CFMEU in relation to coverage of non-tradespersons and plant operators. The CFMEU has moved in recent years to increase its coverage of workers traditionally covered by the AWU. It may therefore be expected that the two unions might contest membership of workers on the project.	Unions may contest membership of workers on the project and tie up management time while a decision is made on which union has coverage and/or attempt unlawful stoppages.		$0					0.0%
HRIR-17	Risk	All works	Use of foreign workers	Foreign worker assumptions (Philippines, NZ, India) may be affected by Covid travel restrictions or other tightening of labour import regulations	Impacts include: - labour shortage - union involvement - code compliance issues	Treatments include: - Monitor COVID vacancies and align with employment medicals - Encourage staff to remain in area on RnR - Options to supplement Linesmen with exp Riggers on works - Upskill local labour through apprenticeships where permitted	$0					0.0%
HRIR-18	Risk	All works	D&A testing	Unclear policy around drug and alcohol testing and consequences.	Impacts include: - disputes and conflict with the workforce	Treatments include: - develop a process and communicate consequences of failed tests. - rigorous testing (alcohol every day before pre-start for high risk work) + random drug testing - compliance with Building Code 2016.	$0					0.0%
HRIR-19	Risk	All works	Breaches of legislated Right of Entry provisions	RoE breaches occur where site teams are unsure of correct process for union RoE, unions put undue pressure on site teams to gain (unapproved) entry to site, potentially leading to disharmony on the project, loss of control of union interaction, loss of productivity/disputation.	Non-compliance with RoE provisions of the FW Act and/or WHS Act leading to potential IR disputation, program delays, fines and/or sanctions against employees, project and/or the parent company.	Ensure adherence to legislated Right of Entry procedures and communicate expectations to all employees and Subcontractors. Managed in accordance with the; 1. Workplace Relations Management Plan 2. Record of entry form and/or record of entry & WHS form 3. RoE flowchart 4. Training provided to site teams on RoE protocol with refresher training sessions conducted during the life of the Project.	$0					0.0%

HRIR-20	Risk	All works	Site access and security across the Project site. Unauthorised access to project site due to open boundaries around Project Office and site amenities.	Boundaries not fully closed off, or unions finding a way into site other than through required project office.	Non-compliance with RoE provisions of the FW Act and/or WHS Act leading to potential IR disputation, program delays, fines and/or sanctions against employees, project and/or individual JV parent company's.	Site security will be setup to best ensure that only authorised persons can access the site. Appropriate signage will be implemented on the Project to ensure visitors are well aware of the requirement to attend the site office and the location of the site office. Ensure that all supervisory staff and Subcontractor representatives are provided with training on the Right of Entry procedure and how to manage any unauthorised access by a union official. Upon receipt of a Right of Entry request under s484 of the FW Act, a written response will be sent to the union official with clear instructions regarding site access and entry location.	$0					0.0%
HRIR-21	Risk	All works	Grievances between direct hire and labour hire workforce employees regarding terms and conditions	Differing terms and conditions in industrial instruments	Union disruption, supplier delayed, resulting in work area program delays, time related costs.	Identify any significant discrepancies between the JV terms and conditions and the Subcontractor terms and conditions prior to commencing on the Project to ensure that potential issues are identified and addressed prior to impacting on the workforce. Grievances managed in accordance with the Workplace Relations Management Plan.	$0					0.0%
HRIR-22	Risk	All works	Breaching Legislation	Breaching JV obligations for employment law due to poor IR planning or compliance with a Site Agreement	Cost for delay and standby	Treatment includes: - prepare and implement an IR Management Plan - negotiate a workable Site Agreement - ensure applicable staff are appropriately qualified and trained	$0					0.0%
HRIR-23	Risk	All works	Poor Employee Relations	Poor employee relations result from unfair dismissal, harassment or diversity issues.	Impacts include: - Cost for delay - Poor quality work - Loss of morale and arise of work cultural problems - Loss of reputation	Treatments include: - Effective IR planning & implementation - Attractive remuneration & conditions - Visible career path - Implement effective succession planning - Implement ongoing training	$0					0.0%
HRIR-24	Risk	All works	Issue Resolution	Issue not being raised through the appropriate channels to be resolved or a delay in the issue being resolved or responded to	Decreased morale and increased union activity. Can result in high turnover	Treatments include: - Ensure prompt responses are provided to any issues raised; - Ensure that the issue resolution procedure is communicated & followed.	$0					0.0%
HRIR-25	Risk	All works	Retention	Personnel turnover (particularly key personnel) can cause disruption and diluted team culture	Impacts include: - Productivity decline - Reputable staff may poach staff that remain - High turnover increases cost of recruitment and onboarding - Program delays - No continuity of staff which drives efficiencies	Treatments include: - Ongoing communication of project progress and achievements; - Early and open communication of other opportunities as the project winds up; - Effectively managing any issues or disputes as they arise; - Consistent alignment between contractor and subcontractor around employment terms & conditions - Monetary incentives to team to stay long term and create conducive site working conditions. - Align team with common tangible goals and implement appropriate recognition	$0					0.0%
HRIR-28	Risk	All works	Daily Travel time	Travel time from camp to workplace is excessive or dangerous due to unexpected poor road conditions and/or unexpected prolific wildlife	Impacts include: - cost of unproductive time - traffic accident impacting wildlife - fatigue	Treatments include: - All busing to be provided by JV for start and end of shift, but subcontractors have responsibility for transport requirements during the work day?? - Otherwise, JV set mandated departure times for buses and subcontractors provide their own busing. - If an employee is responsible for driving a JV vehicle 4WD training will be undertaken	$0					0.0%
HRIR-29	Risk	All works	Communication	Communication across the project is poor in general and outcomes not communicated to the crews	Impacts include: - Poor morale. - Incorrect information being communicated to the crew. - Increased union activity. - Decreased trust in project management.	Treatments include: - Open and effective communication will be delivered by JV management on a regular basis by way of toolboxes, daily pre-starts, notice boards etc.; - Personnel will be directed to Supervisors, not unions to lodge grievances or raise issues. - Will subcontractors use UGL prestart documents or do their own?	$0					0.0%
HRIR-32	Risk	All works	Subcontractor(s) involved in union disputes due to renegotiation of their enterprise agreement during their work on the project, or Subcontractors involved in protected industrial action.	Subcontractors enterprise agreement expires during the duration of their works on the project. Any potential dispute between a Subcontractor and union or delays in negotiation of a new enterprise agreement might adversely affect and impact the project.	Industrial disputation involving Subcontractors - program delay costs, lost productivity, disharmony among workers.	Identify the risk through the Subcontractor pre-screening process. Engage only Subcontractors who will either not be exposed to potential protected industrial action, or those who have an acceptable strategy in place to mitigate that risk. Ensure any Subcontractors experiencing this risk have risk mitigation strategies in place and are adequately prepared to implement those. Assist if required. Undertake steps as soon as possible to bring action to an end by appropriate means. Report to TG representatives and ABCC. Managed in accordance with the; 1. Workplace Relations Management Plan. 2. Subcontractor pre-screening process.	$0					0.0%
HRIR-33	Risk	All packages	Training costs exceed tender allowances	Potential additional training required due to skill shortage in the industry, additional safety training due to changes to legislation or project requirements.	Cost (increase) impact	1. Training budget set at realistic levels, based on TG requirements 2. Lessons learnt from other similar projects 3. Training budget spend, actual vs forecast monitored monthly, any deviation or variance from the forecast will be thoroughly scrutinized and immediately investigated and actioned as necessary. 4. Recoup costs from applicable government grants where possible	$0					0.0%
HRIR-34	Risk	All works	Travel arrangements for FIFO employees	Risks include: - Lack of appropriate departure times, - Lack of available flights. - Inconsistencies between contractors and subcontractors would create IR issues	Consequences include: - Productivity loss - Employee engagement & workplace culture decline	Treatment includes: - Book flights well in advance & communicate to the team - Agreement between subcontractors on travel arrangements to ensure consistency and avoid disparity in R&R travel conditions	$0					0.0%
HRIR-36	Risk	All works	Employee expectation of accommodation standards	Employees have an unrealistic expectation of what the accommodation facilities are prior to mobilising	Poor morale, high turnover, increased mobilisation costs, schedule delays and increased union activity.	Treatment include: - Accommodation details communicated to subcontractors and all employees prior to mobilisation – including all facilities within the camp to ensure expectations are managed - Standardised camp rules for all companies	$0					0.0%
HRIR-37	Risk	All works	Camp Management	Employee misconduct while residing in camp	Impacts include: - Altercations - Removal from camp & project - Physical & property damage	Treatment include: - Expectations around behaviour in camp will be clear in recruitment and induction process, including accepting a Project Code of Conduct outlining camp rules - Rosters to be structured in a way to avoid RDO nights in camp to minimise potential disruption in camp - Camp Rules (including alcohol consumption and curfew times) to be established by Contractor and communicated/agreed by all employees at time of recruitment. Consistent application amongst all Subcontractors	$0					0.0%
HRIR-42	Risk	All works	Worker well being in camp	Inadequate measures for monitoring well being of workers who become unwell while in camp (and don't turn up for work)	Impacts include: - Deteriorating health of worker - Reputational damage - Industrial impacts	Treatments include: - Welfare checks throughout the day that the employee is unwell - Ensure the employee has everything required e.g. food, water - If the employee is unwell for more than 2 days seek medical treatment	$0					0.0%
HSE-01	Risk	All works	Control of weeds and seeds	Unforeseen / onerous requirements for preventing transfer of weeds and seeds along the corridor. Includes washdowns and requirement for all plant and vehicles to have new weed and seed certificate every time they enter a different property.	Large number of Washdowns (possibly at every property boundary), grids, rumble grids, rail ballast, compressor for blow down. -Strain on existing local government washdown facilities with increased use due to project requirements	Allow cost to establish washdowns in budget - Negotiate and work with CuString and properties owners for more feasible control of weed and seeds including: stripping of topsoil on access tracks and CAZ to remove seed bank, allow for blow downs rather than complete washdowns, only require washdowns when entering high risk weed zones , introduce requirement for plant and machines to only require a new weed and seed certificate monthly	$0					0.0%
HSE-02	Risk	All works	Site access during major farming operations	Access for transmission line construction is restricted due to seasonal cropping or mustering (especially helicopter mustering) or other landowner activities	Impacts include: - delay costs - compensation costs to landowners	Treatments include: - obtain understanding of seasonal cropping and farming requirements and arrange construction work around this - if not possible, negotiate access with landholder well in advance of the cropping / farming operation - if not possible, negotiate access using alternative helicopter stringing methods	$0					0.0%
HSE-03	Risk	All works	Dewatering issues	Excess water in foundations that cant be removed from area due to water quality issues / contamination	Works required to stop.	detailed geotechnical report to be completed. Testing regime Dewatering procedure agreed on and in place for when water is encountered Avoid discharges to waterways	$0					0.0%
HSE-04	Risk	All works	Extra clearing areas	Additional access track/break and winch site required due to not planned or constraints requiring B&W sites to be moved or more access tracks required	Works will stop /delayed to permits and approvals to be sought	ensure detailed design so conducted to ensure all areas identified at early stage	$0					0.0%
HSE-05	Risk	All works	Training/competencies	Insufficient environmental staff trained on project	Without relevant qualifications items such as signing off Erosion and sediment controls plans, vehicle washdown approvals., biosecurity checks from imported steel are delayed or cannot be completed.	Ensure TNA is completed, recruitment requirements in recruiting appropriate staff with relevant qualifications plus additional training for some on site	$0					0.0%
HSE-06	Risk	All works	Waste removal/recycling	Lack of recycling and waste faculties along the line	Incorrect waste removal leading to fines Increased cost in disposal of waste due to distance travelled distance to facility Difficulty in recycling due to no facilities / cost out way benefit	More scoping with Waste receivers e.g. Cleanaway to discuss strategy for collections initiative solution to recycling including mulching timber waste Increased focus on Reduce, reuse recycle	$0					0.0%
HSE-07	Risk	All works	Septic removal	Large amounts of septic removal form porta-loos on site and site offices / camps	Overflow of facilities which results in fines and cost of emptying	Look into treatment plants at site offices, pick up porta-loos and empty into these plants. Look at alternative treatment systems plus licences for these - Have site porta-loos on regular clean and empty routine with waste contractor - Have emergency contractor on call to empty sewage ASAP if system fails	$0					0.0%
HSE-08	Risk	All works	Fauna protection and relocation allowances	Requirement to undertake pre clearance of area's to remove fauna prior to clearing and also have fauna spotter present during clearing - Requirement to offset species habitat that has been cleared (dependent on EIS approvals)	- Increased cost to have fauna spotter present at every clearing front (assuming every clearing front requires a fauna spotter) - delays in progress if area's with large inhabitance of fauns are found (etc Koalas cannot be caught and removed, have to move under own accord) - If large number of threatened species are found during clearing it may be required to replace habitat (nest boxes, hollow logs etc)	- Finalise design and schedule early on to allow for correct budgeting of resources (if three different clearing front are likely then allow for 3 fauna spotters) - If clearing is contracted out, include fauna protection and relocation requirements is contractors scope - Ensure EIS captures any likely offset requirements to replace destroyed habitat and include in planning area's which may take longer to clear because of large amounts of fauna / breeding places	$0					0.0%
HSE-11	Risk	All works	Dilapidation studies allowances	Uncertainty around extent/ allowances for dilapidation studies. Need to include roads, fences, farm property, access tracks, assets, etc	not meeting contractual requirements. We are liable to damage already done if we don't document up front	Drone technology, detailed at start, allow for in budget, take photos and videos of everything and file appropriately	$0					0.0%
HSE-12	Risk	All works	Asbestos removal	Allowances for dealing with asbestos, known and unknown.	Disposal costs Reports Hygienists	allow of or in budget and planning. Any additional asbestos found in departures part of contaminated land	$0					0.0%
HSE-13	Risk	All works	PASS/ ASS	Uncertainty about extent of PASS/ ASS that may be encountered in excavations.	Treatment costs	- added lime in budget - Ensure EIS identifies possible PASS/ASS	$0					0.0%

HSE-14	Risk	All works	Breach of Environmental Approval - traffic movement	Community or road authority complain of excessive construction traffic movements on public roads	Impacts include: - Possible breach of EIS and possible fine - cost of delay - loss of reputation	Treatments include: - contact complainant and propose corrective action including implementing regular monitoring of traffic movements - Ensure community engagement (local council) prior to excessive use of road	$0					0.0%
HSE-15	Risk	All works	Dust complaint	Construction dust impacts local community, nearby roads, livestock or pollutes existing substations	Impacts include: - breach of EIS and possible fine - delay costs - loss of reputation - flashover/failure of existing substation plant due to dust pollution	Treatments include: - contact complainant and propose corrective action - implement regular dust monitoring and suppression - implement pre-start meetings identifying/addressing dust generating activities on site	$0					0.0%
HSE-16	Risk	All works	Fauna protection	Damage to native fauna a result of construction activities	Impacts include: - fine from EPA for breach of relevant act - restitution measures - possible injury to personnel (e.g. snake bite) - loss of reputation	Treatments include: - prepare and implement an effective CEMP including mapping of species in relation to the site(s) - conduct appropriate training of all personnel in fauna awareness and avoidance/protective measures - implement regular checking and reporting - use appropriate PPE	$0					0.0%
HSE-17	Risk	All works	Chemical/Dangerous Material Use	Poisoning, Harm to People/Fauna/Flora/Livestock Acute or chronic exposure to hazardous chemicals	Criminal Prosecution/Liability Loss of Reputation Fine WHS Act/Regs Adverse State Media or public attention. Federal/State Government scrutiny	UGL Critical Risk Control Protocol 9 Hazardous Chemicals are risk assessed and controls are implemented prior to storage or utilisation on site. Identification signage/labelling is in place on vessels, containers or pipes containing hazardous chemicals, including when decanted. Current Safety Data Sheets are available at the worksite and the required controls are applied. Hazardous chemicals are segregated from, and do not come into contact with, incompatible materials. Chemicals are stored in designated storage areas and containers when not in use, with sufficient bunding to contain potential spills/leakage. All subcontractors to have all hazardous substances approved for use and regular audits undertaken.	$0					0.0%
HSE-19	Risk	All works	Electricity	Electrocution or serious permanent electric shock injury due to: - direct contact with electricity - Striking overhead or underground electrical lines - Arcing of electricity/Flash - Induction	Criminal Prosecution/Liability Loss of Reputation Fine WHS Act/Regs Delays Adverse State Media or public attention. Federal/State Government scrutiny	Electrical Safety Act 2002 Electrical Safety Regulations 2013 UGL Critical Risk Controls - Working with Electricity 1. All electrical equipment is compliant with Australian or international standards, tested for ground continuity, tagged and recorded. 2. Testing and tagging of portable electrical equipment is conducted by appropriately trained and competent persons. 3. Welding equipment is correctly earthed and staked as required by the OEM. Voltage Reducing Devices (VRD) are installed and tested for all Manual Metal Arc welding machines. 4. Live cabling is protected from mechanical damage. 5. All temporary electrical leads are secured off the ground by insulated hooks and/or lead stands. 6. SWMS/JHA's/Safe Work Instructions are developed and approved for all activities involving the potential for contact with live conductors. If a risk of contact with electrical energy exists, controls are identified and implemented including the provision and use of insulated tools, gloves, mats, low voltage rescue kits. 7. All live electrical circuits are identified prior to any penetrations of surfaces (walls, flooring and roofing). 8. Temporary electrical works are installed, tested and certified in accordance with the applicable standard. 9. All circuits and powered equipment have Residual Current Device (RCD) protection. 10. When working near live Overhead Line Equipment (OHLE) or live electrical parts, regulated safe working distances/exclusion zones are identified and maintained. 11. Isolation/Permit System 12. Adequate First Aid Procedure including sufficient Potable Water Supplies.	$0					0.0%
HSE-21	Risk	All works	Mobile Plant	Moving plant or equipment	Fatality or serious permanent injury to operator or persons nearby due vehicle crush or entrapment caused by plant or equipment roll over or loss of control. Fatality or serious permanent injury to pedestrian or other plant/equipment operator due to being struck by moving plant / equipment Fatality or serious permanent injury	1. Plant risk assessments are conducted and plant is inspected by a competent person to confirm it is fit for purpose prior to utilisation on site. 2. Earth moving machinery is fitted with compliant Rollover Protection (ROPS) and Falling Object Protection (FOPS), unless risk assessment has demonstrated that they are not reasonably practicable. 3. Mobile plant is fitted with effective safety devices such as reversing alarms, rotating/flashing lights, communication device (radio), seatbelts and fire extinguishers. 4. Mobile Plant operators hold the appropriate licences and competencies for the plant they are required to operate. 5. Mobile Plant and vehicle operators always find a stationary position in a safe place prior to handling a mobile phone. 6. Pre-start and periodic servicing of mobile plant and vehicles are conducted in accordance with OEM and statutory requirements and any deficiencies are reported for correction. Safety related deficiencies are resolved before equipment is put into operation. 7. Mobile plant is always switched off and braking mechanisms are applied before being left unoccupied.	$0					0.0%
HSE-22	Risk	All works	Power Tool Use	Unsafe Tools Modified Tools Sub standard part or consumables Electricity	Injury to Personnel Damage to equipment Incorrect Tool use Tool Failure Electrical Shock	Electrical tool inspection and tagging (RGBY) Tool Guarding in place Prohibited Tool list Manufacturers Operation Manual Dead mans switch fitted PPE No tool modifications)	$0					0.0%
HSE-23	Risk	All works	Health and Wellbeing	Poor Hygiene Lack of facilities	COVID-19 Melioidosis Infections Illness/hospitalisation Loss time Reputation Fine WHS Regulation Unfit for work Mental Health	Compliance with the Work Health and Safety Regulation 2011 UGL Fitness for Work Policy and Procedure Drug and Alcohol Testing Protocol. UGL Covid 19 Protocol Journey Management Plan. Adequate on site facilities (toilet, washing facilities, fridges food heating etc). Employee Assistance Program Camp Facilities Roster/Schedules, awareness programme RUOK etc.	$0					0.0%
HSE-24	Risk	All works	Ergonomic	Manual Handling Poor Posture	Sprains/Strains Lost time musculo skeletal injuries	Eliminate requirement for manual handling using mechanical aids where possible Training Risk assess individual tasks, identify hazards and introduce necessary controls to reduce/eliminate	$0					0.0%
HSE-27	Risk	All works	Excavation and Trenching	Entrapment & tipping	Fatality or serious permanent injury to worker or nearby persons due to: - Equipment striking underground electrical or gas services - Person falling into excavation - Entrapment or crushing injuries due to collapse of excavation - Exposure to harmful ground contamination	UGL CRC Protocol 4 Personnel involved in excavations are trained and competent to understand the hazards and controls associated with excavations. 4.2 Underground services are positively located and identified by mechanisms such as: – Pot-holing – Scanning as well as from potential sources such as: – 'Dial Before You Dig' – Asset owners – Reticulation plans – Client/property owners etc. 4.3 Spotters are in place during excavations in the vicinity of underground services. 4.4 Safe Approach Distances (SADs) for underground services have been identified as per the asset owner's requirements, with no mechanical devices used within the SADs. 4.5 Excavation and trenching (>300mm) activities are authorised by a permit. The permit identifies the hazards and controls specific to the task and defines the emergency management requirements. 4.6 Excavations >1.5m have been planned with a temporary works design, and include controls such as boxing, benching, battering or shoring & de-watering. 4.7 Excavations are established and monitored to safely enable access and egress and maintain stability. Physical barriers around excavations are installed to prevent unauthorised or inadvertent access by workers, members of public livestock or	$0					0.0%
HSE-28	Risk	All works	Cranes and Lifting Operations	Gravitational Energy	Fatality or serious injury to operator, dogman or others nearby and under loads being lifted due to; - Equipment failure, overturn or crane collapse - Large falling objects or loads Fatality or serious permanent injury due to crane collision with people, other plant or structures	UGL CRC Protocol - 5.1 Cranes are inspected by a competent person in accordance with statutory & OEM requirements and maintenance log books are current (with no open safety related deficiencies). 5.2 Lifting gear is periodically inspected & tagged by a competent person and visually inspected prior to being used in accordance with OEM specifications. 5.3 Limiting and indicating devices are fitted to mobile cranes, with load indicators fitted to all mobile cranes with a rated capacity >3 tons. 5.4 Crane operator and dogman/rigger have effective communication processes in place. 5.5 Crane operators & persons slinging loads have appropriate licences and competencies. 5.6 The type and weight of loads is confirmed and is less than the safe working load of the lifting device. 5.7 Risk Assessments (SWMS/JHA) and Lift Plans are developed and approved for significant lifts. 5.8 Ground conditions are assessed by a competent person to determine the controls required for ensuring the stability of the lift. 5.9 Exclusion zones are established and nonconductive tag lines used to guide loads. Personnel remain outside exclusion zones at all times, and never walk or stand under suspended loads. 5.10 Outriggers are effectively deployed in accordance with OEM specifications. 5.11 Loads capable of shifting until secured remain attached to the lifting device and tag lines, or are	$0					0.0%

HSE-30	Risk	All works	Managing Traffic	Traffic & Pedestrian interaction	Fatality or serious injury due to pedestrian being struck by vehicle or mobile equipment, or collision of vehicles to vehicles, equipment or other objects	UGL CRC Protocol - 8 Mobile plant and vehicle movements on sites are in accordance with an approved Traffic Management/Movement Plan which is available to all personnel. 8.2 Physical (solid barrier) separation from mobile plant operations are used to protect personnel and/or members of the public wherever practicable. 8.3 Loading/unloading zones are clearly delineated with controls to prevent unauthorised access. 8.4 All overhead services and structures in the work area are identified with appropriate control measures to prevent collision by mobile plant and vehicles. Access Roads to be individually risk assessed. Site access Controls/visibility. signage, approved access routes	$0					0.0%
HSE-31	Risk	All works	Inclement Weather	Extreme Heat Cold Flooding Lightning High Winds	Fatality or serious injury from Lightning strike Fatigue Heat Exhaustion Heat Stroke Hyperthermia Isolation from flooding, unable to return to accommodation or access emergency services. Water run off	Weather Monitoring and Awareness (Lightening Tracker) Lightning Early warning system (message/radio) Alerts vacate the work face and return to accommodation. Provision of Shade, Water bottles and Esky/Ice, Work Rotation. Job/ Task Planning - Provision of PPE (SunSmart) Training and Awareness. Specific Gravity Testing of Urine. Flood map to be used to identify potential flood incursion zones. Satellite phone at each location one per crew as a minimum. Weather forecasts taken into consideration prior to conducting civil works Hydration testing & Electrolyte supplements. Weather zone lightning monitoring service. Emergency Response Drills regularly conducted. Satellite phones kept fully charged on a daily basis with capability to rechange in the field. High Winds Roster and shift adjustments to allow for wind/lighting conditions.	$0					0.0%
HSE-32	Risk	All works	Working near Culturally Sensitive Areas	Impact to a Culturally sensitive site Unexpected finds	Prosecution or Fines Damage to heritage items Business reputation damage.	Land Access Permits Flagging and Signage (Signage Preferable) Cultural Heritage Awareness inductions GPS equipment in earth moving equipment Cultural Monitor present for guidance as per land access protocols GIS mapping and iPad Technology - Single Source. Communication and Awareness during Prestarts/Toolbox talks Stop work, Reporting of all suspected cultural finds documented and relevant stakeholders notified. Daily monitoring by UGLCPB JV supervisor	$0					0.0%
HSE-33	Risk	All works	Arial Operations using Fixed Wing/Rotary Aircraft/Drones	Pilot Error Mechanical Fault/Failure Weather Conditions Collision - Structures/conductor/other Aircraft Aviation fuel to ground	Single/Multiple Fatalities/Serious Injury Property Damage	1. Refuelling will be executed at an approved CASA facility 2. Strict CASA requirements for maintenance complied with, Daily prestarts and post flight reporting. 3. Pilot to adhere to flight plan and maintain altitude, Flight to be terminated should it be unsafe to fly at altitude requirement under the flight plan. 4. Competent pilot/s and ground crew 5. Not to operate in poor/adverse weather conditions 6. Drone use to be investigated	$0					0.0%
ITS-01	Risk	All works	Data Security	The risk of Data Security event caused by a breach of security resulting in loss of information - Design and construct phase - Operate & test - Commission & test phase 1. Lose data or information. 2. Information accessed by 3rd parties for malicious intent and gain advantage. 3. Corruption of data or information by 3rd parties.	1. Rework to recover the data and information resulting in time and cost. 2. Loss of competitive advantage 3. Lose ability to operate or restrictive operation causing loss of revenue 4. Cost to recover data or construction function	- Dedicated servers - Server backups at regular intervals - Firewall protection - IT system managed by Corporate IT support, i.e. access to system, procedures, control of IT - Access to the system	$0					0.0%
ITS-02	Risk	All works	Data Security during EPC	The risk of Data Security event caused by a breach of security resulting in loss of information - Design and construct phase - Operate & test - Commission & test phase - Business operations 1. Lose data or information. 2. Information accessed by 3rd parties for malicious intent and gain advantage. 3. Corruption of data or information by 3rd parties.	1. Rework to recover the data and information resulting in time and cost. 2. Loss of competitive advantage 3. Lose ability to operate or restrictive operation causing loss of revenue 4. Cost to recover data or operational function	- Dedicated servers - Server backups at regular intervals - Firewall protection - IT system managed by Corporate IT support, i.e. access to system, procedures, control of IT - Access to the system	$0					0.0%
ITS-03	Risk	All works	Software Licencing	The risk of Software Licencing availability caused by expiry requirements resulting in a software failure	Multiple software will be required for the project which will include software for financial data manipulation, project planning and scheduling, design calculations and drafting, communication through letters, emails and meetings and seeking information and bookings. Any failure of these software will have an impact to the continuity of works.	- Use of registered software - Software licencing which remains current for the duration of the project	$0					0.0%
ITS-03	Risk	All works	Software Licencing during EPC	The risk of Software Licencing availability caused by expiry requirements resulting in a software failure	Multiple software will be required for the project which will include software for financial data manipulation, project planning and scheduling, design calculations and drafting, communication through letters, emails and meetings and seeking information and bookings. Any failure of these software will have an impact to the continuity of works.	- Use of registered software - Software licencing which remains current for the duration of the project	$0					0.0%
ITS-04	Risk	All works	Hardware Availability	The risk of hardware availability caused by an event resulting in loss off use. An event could be theft, fire, flood or other risk.	Loss of hardware availability will have a disruption to the project which will include computer use for data storage, financial data manipulation, project planning and scheduling, design calculations and drafting, communication through letters, emails and meetings and seeking information and bookings. Any failure of these software will have an impact to the continuity of works and infrastructure.	- Dedicated project computers for use by team - Dedicated communication/visual equipment for use for the project duration - Office security in place to protect computer and IT hardware - UPS equipment in place for the continued use of IT equipment	$0					0.0%
ITS-04	Risk	All works	IT Hardware Availability during EPC	The risk of hardware availability caused by an event resulting in loss off use. An event could be theft, fire, flood or other risk.	Loss of hardware availability will have a disruption to the project/infrastructure which will include computer use for data storage, financial data manipulation, project planning and scheduling, design calculations and drafting, communication through letters, emails and meetings and seeking information and bookings. Any failure of these software will have an impact to the continuity of works and infrastructure.	- Dedicated project/infrastructure computers for use by team - Dedicated communication/visual equipment for use for the infrastructure/project duration - Office security in place to protect computer and IT hardware - UPS equipment in place for the continued use of IT equipment	$0					0.0%
ITS-05	Risk	All works	Secondary Systems Corruption	Risk of Testing & Commissioning teams causing incorrect configurations resulting in primary plant configuration errors and access by other parties	Mall operation leading to operational errors or failures, system outages and potential asset damage. - i.e. protection on a transformer resulting in overheating	- Backups at regular intervals - Firewall protection - IT system managed by Corporate IT support, i.e. access to system, procedures, control of IT - Access to the system - Use of Corporate approved laptops used for testing and commissioning - Software / firmware architecture, configuration and compatibility	$0					0.0%
ITS-07	Risk	All works	Site Security	The risk of security of office area and site records caused by an event on site	Office will contain IT equipment, records, communications equipment, vehicles and tools required to construct and manage the project. Loss of this will be a disruption to the project.	- Site security - Offices and storage areas located on ground above flooding events and fire secure - Offices which are secure - Continuous roster - Locking of sensitive hardcopy records - Data storage protocol to prevent loss of records	$0					0.0%
PROC-01	Risk	All works	Commercial conditions - L.D.'s, time bars etc.	Risk that the project is not finished by the PA date, caused by delays in JV control and delays outside JV control which do not provide for EoT. (SRA to address any time related risk)	Liquidated Damages being incurred ($xxxk per day) and subsequent direct and indirect costs incurred. Additional costs incurred as a result of acceleration to avoid LD's.	SRA Analysis conducted. Seek early award / access to key areas, mobilisation of additional resources during completions / commissioning. Maximise program opportunities during the construction of the works. Acceleration measures - additional resources, increase working ours, resequencing of the works. LD penalties not expected.	$0					0.0%
PROC-02	Risk	All works	Cashflow	Inadequate cashflow management results in cash negative position.	Interest charges incurred. Flow on effect to subcontractor payments - Insolvency of subcontractors.	Negotiation of favourable payment terms. Designated Finance Manager (Close management of cashflow position). Cashflow calculation carried in estimate.	$0					0.0%
PROC-03	Risk	All works	Client payment delays	Payment delays result in negative cash position for D&C	Late approval of claims. Negative impact on project cash-flow. Interest charges incurred.	Contract sets out payment terms (Refer Deed clause xx) to certify progress payment, paid x days from issue of certificate, max duration between claim and payment of xx Business days (except for disputed amounts). Variations to be submitted and agreed as project proceeds. Maintain sufficient cash reserves in project to cover underclaim. Request up-front payment.	$0					0.0%
PROC-07	Risk	All works	Security Provisions -Insurance Bond Rate	Potential to attract a reduced rate for the provision of Insurance Bonds through negotiation.	Lower interest is paid on Insurance Bond	Look at alternate strategies with JV corporate to obtain competitive rates for Insurance Bond provisions.	$0					0.0%
PROC-13	Risk	All works	Demurrage for offshore procurement	Demurrage for offshore procurement	Demurrage costs incurred	Negotiate an acceptable rate for demurrage and include in contract	$0					0.0%
PROC-15	Risk	All works	Import Duties	Assumptions about import duties incorrect or subject to change E.g. xxxxx, etc	Increased cost of Import Duties	Import Duties to be reviewed by experienced logistics providers.	$0					0.0%
PROC-17	Risk	All works	Insolvency of JV party	One of the D&C or FM or sponsor companies becomes insolvent before or after bid submission	Joint & several share increases		$0					0.0%

PROC-19	Risk	All works	D&C Procurement approval	JV procurement approval process delays the commencement of subcontractors / suppliers / consultants.	Works on site are delayed or disrupted and resequencing of the D&C activities is required.	Ensure procurement process includes adequate time to allow extended negotiations, all approvals and signing of the document.,	$0					0.0%
PROC-20	Risk	All works	Supplier Payment Terms	Negotiations with major suppliers and subcontractors fails to secure payment terms consistent with D&C / SPC payment terms	D&C Contractor has to fund the difference	D&C Contractor to agree a payment process that results in the shortest time possible from the EOM. Submit the payment claim to SPV in last 1/3 of month for work up to the end of month	$0					0.0%
PROC-24	Risk	All works	Warranty Periods	Suppliers do not provide a warranty period which will protect the D&C JV from incurring costs in the event that a defect arises during the defect rectification period	D&C Contractor is required to pay the supplier to rectify equipment which is outside the warranty period	Negotiate back to back warranty for major plant and equipment such as HV power and instrument transformers, HV reactors, HV switchgear and qualify if this is not possible. Note that this will need to be resolved before tender submission.	$0					0.0%
PROC-25	Risk	All works	Sub consultancy Agreements	The subconsultants do not agree to back to back provisions in the consultancy services agreements; risks with the gap is left with the D&C JV ; Cap on Liability, exclusions and carve outs to loss/damage, indemnities, etc	D&C JV are not able to pass on claims to subconsultants	Ensure back to back agreements are negotiated with Subconsultants	$0					0.0%
PROC-26	Risk	All works	Construction Bonds	The D&C Subcontractor is required to replace any undrawn amount of a Construction Bond within a specified period of the issuer of the Construction Bond ceasing to have the Required Rating	Replacement of construction bonds with (A) A- (S&P) or higher; and (B) A3 (Moody's) or higher, whose fee is higher than previous provider	Use reputable and reliable bond providers	$0					0.0%
PROC-29	Risk	All works	Damage to JV assets	Damage to JV assets (or a 3rd party for which JV is responsible) due to any of the following: - Fire, collapse, flooding, explosion, impact - Terrorist activity, demonstration, sabotage - Whilst in storage - Whilst in transit	Cost of excess not recoverable from insurance claim and for delay and/or standby of labour and plant resources	Treatment as follows: - Implement effective insurance policies - Implement effective site security plan, including roving patrols, security systems, fire management plans	$0					0.0%
PROC-30	Risk	All works	Theft	Theft of JV assets (or a 3rd party for which JV is responsible) due to any of the following: - Assets, Computer/Data, records, Money, Staff property - Identity theft	Cost of excess not recoverable from insurance claim and for delay and/or standby of labour and plant resources	Treatment as follows: - Implement effective insurance policies - Implement effective site security plan, including roving patrols, security systems, fire management plans	$0					0.0%
PROC-32	Risk	All works	Strategic Consistency	JV suffers difficulties in communicating or controlling remote locations and/or multiple sites	Consequences include: - cost for delay & standby - poor productivity - poor quality - poor reputation	Treatment as follows: - effective workload planning - effective resource planning and related training - effective communications	$0					0.0%
PROC-36	Risk	All works	Cost Escalation	Labour cost increase associated with large direct employed workforce	Large multi-state project attracts unplanned Site Allowance and/or unplanned larger or more frequent hourly rate increases which result in cost overruns	Treatment as follows: - Negotiate a greenfields Site Agreement before tender submission - Benchmark labour rates and allowances against other similar projects during tender e.g. HumeLink	$0					0.0%
SS-04	Risk/ Opp	All Sub-Stations	Rework - poor fabrication	Foreign sourced structural steel requires significant rework including replacement of gantry members, redrilling holes, regalvanising etc	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - assign expat expeditor to factory to ensure quality and packaging requirements are observed - ensure supply contract contains appropriate cost recovery provisions for any site rework	$0					0.0%
SS-05	Risk	All Sub-Stations	Rework - quality control	Poor quality work including earth welding, cable support systems, cable terminations, interpanel wiring, grouting, HV conductor installation/crimping, poor adherence to drawings.	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - implement effective recruitment that validates previous experience/performance - implement effective quality assurance - implement effective training - apply effective supervision	$0					0.0%
SS-06	Risk/ Opp	All Sub-Stations	Rework - unreasonable superintendent	Superintendent unreasonably rejects work on basis of poor quality	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - plan and implement effective engagement with superintendent - ensure appropriate issue resolution process is implemented (non-contractual) - implement effective relationship training - implement effective commercial management at project level	$0					0.0%
SS-07	Risk/ Opp	All Sub-Stations	Rework - 3rd party installation	Third party responsible for in-situ installation of power transformers lacks competence or encounters defective plant	Impacts include: - cost of delay - loss of reputation	Treatments include: - implement effective vetting of supplier's proposed 3rd party installer or preferably, influence supplier for JV self-performance of installation - implement effective supervision - implement effective contract to ensure that the risk of installation sits with the Transformer supplier.	$0					0.0%
SS-08	Risk	All Sub-Stations	Congestion	Relatively small site results in congestion relating to disruption of 1 or more construction activities e.g. installation of control cables interferes with passage of mobile cranes, pre-commissioning testing prevents construction access (Mt Isa - potential issue)	Cost of delay and standby	Treatments include: - effective scheduling and work planning - implement effective supervision - implement SWMS to ensure safety - implement effective workplace barricading - implement program flexibility to reallocate resources to other activities	$0					0.0%
SS-09	Risk	All Sub-Stations	Site security - theft and vandalism	Loss or damage to plant equipment and / or materials, caused by expensive 'target' plant e.g. syncon, transformers and other HV equipment on site.	Loss of essential items causing programme delay. High value items such as these will generally have an extremely long lead time if repair and / or re-order is required	Treatments include: - additional security guards (24/7) in some locations - addition of cameras / security systems (monitored) - storage of equipment off site, delivered JIT, as required only	$0					0.0%
SS-10	Risk	All works	JV resource restrictions	Potential resource restrictions due to other projects, due to increased activity in the HV market. National and international shortage of skilled resources and willingness to relocate to areas.	Delays to programme	Treatments include: - incentive schemes to increase interest - recruit early (now) before requirement becomes crucial - approach market for expressions of interest	$0					0.0%
SS-11	Risk	All Sub-Stations	Powerlink acceptance of installation processes / methods (working at heights)	SWMS / JHA's not in-line with Powerlink / CuS latest Safety Requirements	Delays to programme	Treatments include: - review existing records of previous method statements etc used on Powerlink projects - modify, re-write, write suitable SWMS, JHA's prior to site takeover - request early Powerlink comment / approval of installation and pre-commissioning documentation - initiate / create a focused working group to complete the above	$0					0.0%
SS-13	Risk	All Sub-Stations	Low value, long lead items	Damage to specialised equipment that is low value with long lead times	Delays to programme to replace, repair, re-order	Treatments include: - include additional contingency with replacement components, spares, product	$0					0.0%
SS-14	Risk	All Sub-Stations	Failure of major installed plant / materials	Equipment delivered and installed, that fails post delivery either during SAT or anticipated 'normal' running. Equipment may have been damaged during transit and / or installation (FAT would have been successfully passed).	Delay to installation, pre-commissioning	Treatments include: - additional product / spares - robust post delivery QA upon delivery and not later once put into long term storage if required - supplier onsite during installation and post to sign off QA	$0					0.0%
SS-15	Risk	All Sub-Stations	SF6 gas discharge during installation	Equipment failure causes gas discharge during filling operation (post installation). Incorrect filling procedures, damage during installation.	Leakage of gas to the atmosphere, reworking of installation, rework of SAT required, delay to overall testing and pre-commissioning programme.	Treatments include: - ensure staff are adequately experienced and /or trained to the satisfaction of the supplier - supplier in attendance (supervision) - use of supplier provided methodology for installation and testing	$0					0.0%
SS-16	Risk	All Sub-Stations	Immaturity of main plant design (primary, secondary) at the early works stage	Complexity of design at the early works stage due to unknown factors / missing details provided by Powerlink, resulting in P.O.'s not being placed in good time to meet the schedule.	Delays to programme ultimately but could be caused by delays to procurement as all technical details are not agreed with Powerlink / supplier	Treatments include: - confirmation of all related technical specifications by Powerlink early (prior to orders being placed or responsibility of late changes at owners risk)	$0					0.0%
SS-17	Risk	All Sub-Stations	Out of hours, outdoor working not permitted (within EIS)	Weekend and / or extended working hours not being permitted, due to planning noise constraints for example, caused by working noise, traffic movements outside normal construction hours.	Residents / local complaints could lead to stop notice delays.	Treatments include: - agree extended hours with early contract negotiations with Powerlink for specific tasks (night shifts will be required during pre-commissioning) - plan ahead and early - increase working groups / resources during normal construction hours (accelerate)	$0					0.0%
SS-19	Risk	All Sub-Stations	Performance testing (noise) at project end - compliance with EIS	Noise from operating plant exceeding Powerlink / EIS constraints.	Additional design, materials and labour to rework, correct and / or replace equipment	Treatments include: - replace equipment causing the issue - install noise barriers - ensure suppliers are onboard with EIS compliance and have tested successfully via FAT	$0					0.0%
SS-20	Risk	All Sub-Stations	Stakeholder reputation due to high profile project	Stakeholder reputation causing disruption to local residents if the project delivery runs later than anticipated, as this will be a very visible project in Australia.	Reputation of JV and Powerlink within the HV community and worldwide	Treatments include: - employ external marketing company to manage stakeholder reputation / expectations - continued dialogue with Powerlink during all facets of the project to provide third party continued free-flowing communication to all stakeholders	$0					0.0%
SS-21	Risk	All Sub-Stations	Redesign of site boundaries to suit planning requirements	Aesthetics of the HV equipment may result in additional designs (late) thereby increasing costs and duration.	Complaints by local residents that may damage JV reputation and ultimately delays to the construction process	Treatments include: - employ external marketing company to manage stakeholder reputation / expectations - continued dialogue with Powerlink during all facets of the project to provide third party continued free-flowing communication to all stakeholders	$0					0.0%
SS-23	Risk	All Sub-Stations	Interface with third parties (outside of Powerlink contract)	Interface with third parties that are not contracted to the JV and / or Powerlink e.g. subcontractors working in nearby proximity to the JV that are working for another utility company causing access issues.	Delays to planned works	Treatments include: - early understanding of any works within close proximity to the sites during the project timescales - local and regular dialogue as required to mitigate access risks (site team)	$0					0.0%
SS-25	Risk	All Sub-Stations	High water table	Water to be pumped has potential to contaminate nearby water courses / surrounding water area.	Additional activities, notably at the start of a shift to remove excess water, especially during the wetter months	Treatments include: - ensure that the Geotech in hand informs the JV early - plan to complete any affected areas in the dryer seasons - pre-start early to ensure that any excess is removed prior to shifts starting	$0					0.0%
SS-26	Risk/ Opp	All Sub-Stations	Powerlink 'working under rules'	Programme delays and / or changes instigated by Powerlink resulting in areas having to be worked on under rules rather than as initially planned, with free access.	Extended periods and / or out of hours working to maintain the planned end dates proposed at tender	Treatments include: - ensure that the programme is robust at tender to ensure that adequate resources are available to complete the majority of the works outside of Powerlink Safety Rules (related to live system working only)	$0					0.0%
SS-28	Risk/ Opp	All Sub-Stations	Contaminated land / buildings including asbestos	Potential for contaminated land and / or buildings to be discovered in brownfield areas of work. Check Mt Isa - settlement pond from existing power station)	Additional costs and time delay due to additional surveys and investigations required, included where necessary specialist removal of debris / material.	Treatments include: - complete full surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans nearby - check local history of plant / building use nearby and / or in situ	$0					0.0%
SS-30	Risk	All works	Estimated labour rates	Changes by JV parent companies exceed Tender increases.	Additional labour costs, possibly resulting in overspend and / or use of third party labour hire to fill the gaps, possibly resulting in reduced quality of work, increased rework, additional training, programme delays.	Treatments include: - guaranteed lock in with parent companies of labour rates for the full duration of the project - contingency allowance for additional labour	$0					0.0%

SS-31	Risk	All Sub-Stations	Unknown pandemic and / or restrictions to site access by national / state government e.g. COVID, bird flu, foot & mouth, blue tongue, anti-terrorism measures etc.	Unforeseen delays caused resulting in lack of site access / minimal resource availability.	Interruption to planned sequencing and ultimately delays to the overall project programme.	Treatments include: - ensure Powerlink contract excludes responsibility and allows for such 'unplannable' (force majeure) events	$0					0.0%
SS-32	Risk	All Sub-Stations	Damage to existing / old equipment during construction / pre-commissioning	Damage to existing equipment and / or systems	System unable to operate adequately, potential blackout	Treatments include: - ensure that all existing equipment is identified along with any potential unknown events - where possible provide spares / replacement parts for critical components, including long lead items - provision of adequate training and / or staff	$0					0.0%
SS-33	Risk	All Sub-Stations	Supply chain issues (Procurement?)	Supply chain issues caused by: (i) limited resources in marketplace (ii) faulty material (iii) liquidation of sub-suppliers (iv) poor performance	Late issue of products, poor quality, delays caused by replacement parts being required	Treatments include: - additional product / spares - robust post delivery QA - supplier onsite during installation and post to sign off QA	$0					0.0%
SS-35	Risk	All Sub-Stations	Availability of Powerlink commissioning staff	Powerlink staff unavailable or not enough resources to cater for all aspects of the outage requirements.	Results in outages being delayed, late, extended and / or missed.	Treatments include: - continued discussion during commissioning meetings to book sufficient and adequate resources well in advance of the requirement to maintain the project programme	$0					0.0%
SS-38	Opportunity	All Sub-Stations	Unforeseeable compatibility interface between existing and new equipment	Verification of new equipment meeting needs has not been tested in the locations requiring modification.	System requirements being unfulfilled	Treatments include: - risk to be written out of JV responsibility - Powerlink to provide written guarantees that the existing system will be adequate	$0					0.0%
SS-40	Risk	All Sub-Stations	Protester action	Protesting actions e.g. civil disobedience, industrial dispute	Access delays, danger to staff, delays to programme.	Treatments include: - continued liaison with locals / Powerlink - regular community updates - employment of locals during the project duration to create buy-in	$0					0.0%
SS-43	Risk	All Sub-Stations	Emergency return to service (ERTS) implementation	Additional costs for implementing ERTS or providing contingency support and acceleration measures.	Increase in costs and re-sequencing issues.	Treatments include: - continued discussion during commissioning meetings to book sufficient and adequate outages well in advance of the requirement to maintain the project programme	$0					0.0%
SS-44	Risk/ Opp	All Sub-Stations	Delay to approval of protection settings	Disruption to pre-commissioning programme if withheld by Powerlink.	Increase in costs and re-sequencing issues.	Treatments include: - continued discussion during commissioning meetings to book sufficient and adequate outages well in advance of the requirement to maintain the project programme	$0					0.0%
SS-45	Risk/ Opp	All works	Employers responsibilities	Employer's responsibilities and activities not being discharged as defined within the contract / Powerlink policies and procedures.	Delay to approvals, ultimately delay to the programme	Treatments include: - regular open communication during the course of the project - STEERCO intervention if / when required if both parties at site level cannot resolve open issues	$0					0.0%
SS-46	Risk	All Sub-Stations	Uninsured losses	Uninsured losses resulting from a defect after the cover for such losses has expired.	Additional costs.	Treatments include: - ensure adequate cover and or provide sufficient provision or contingency to cater for such uninsured periods	$0					0.0%
SS-47	Risk	All Sub-Stations	Uncontrolled fire	Potential fire damage to staff, new and / or existing equipment, buildings, assets, land	Damage to existing resources / property resulting in a major delay to the project.	Treatments include: - no smoking in general site - designated area only - fire fighting equipment in all admin / office areas - fire fighting equipment in all company vehicles - procedural controls in place during high risk activities / seasons / locations	$0					0.0%
SS-48	Risk	All Sub-Stations	Non-compliance with occupational and design safety requirements	Inexperienced design personnel	Personal injuries, system interruption	Treatments include: - ensure that all designs fully comply with appropriate and relevant standards - use of experienced design engineers	$0					0.0%
SS-49	Risk	All Sub-Stations	Compliance with AEMO connection requirements	Some designs may pre-date AEMO compliance requirements (Design risk)	Compliance may require additional scope and / or rework	Treatments include: - ensure compliance through thorough checking / approvals process - exclude work associated with switchyard upgrade requiring AEMO compliance	$0					0.0%
SS-50	Risk	All Sub-Stations	Protection / control system Interface and integration	Switchyard extensions will have to interface with existing protection system	Additional upgrade work may be required	Treatments include: - To monitor and identify at early stage of any potential problem with interfaces	$0					0.0%
SS-51	Risk	All Sub-Stations	HV cable failure	Suppliers providing substandard products	Replacement of failed cable, resulting in additional man hours for installation, termination, pre-commissioning and commissioning	Treatments include: - select well proved products - select competent suppliers with proven track record - insert back to back T&C clause for warranty on failures and replacement	$0					0.0%
SS-52	Risk	All Sub-Stations	HV cable terminations	Some suppliers have substandard products	Replacement of failed termination(s), resulting in additional man hours for connection, termination, pre-commissioning and commissioning	Treatments include: - select well proved products - select competent suppliers with proven track record - insert back to back T&C clause for warranty on failures and replacement	$0					0.0%
SS-53	Risk	All Sub-Stations	Customer's specification	Very detailed but may be contradictory in places due to the number of authors and number of documents	Misunderstandings / misinterpretation between Powerlink and JV on the project requirements	Treatments include: - engage experienced design engineers - regular internal design review meetings - regular design co-ordination meetings to be held with Powerlink	$0					0.0%
SS-54	Risk	All Sub-Stations	Failure of equipment to meet performance test	Equipment does not meet specification requirements	Rework and delay	Treatments include: - JV to strictly follow QA procedure for manufacturing of equipment - JV to closely monitor design and manufacturing process of equipment - FAT's and SAT's successfully completed and witnessed	$0					0.0%
SS-56	Risk	All Sub-Stations	Unidentified service	Services encountered during excavation activities	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - dial before you dig - Geotech completion in all relevant locations - trial holes / use of current drawings / as-builts - preliminary site surveys	$0					0.0%
SS-60	Risk	All Sub-Stations	Traffic accident	Incident / accident within the site and / or entering or leaving site	Injury, fatality, equipment damage, prosecution by WorkSafe, loss of reputation	Treatments include: - provide separate entry / egress points to the site - work to traffic management plan - clearly labelled pathways and traffic access points - site restriction imposed by temporary / permanent fencing - JV safety procedures adhered to for working in proximity to traffic - SWMS's / JHA's in place - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0					0.0%
SS-64	Risk	All Sub-Stations	Major fuel spill	Caused by the number of vehicles requiring filling near to or on the site due to remote locations	Impacts include: - fine from EPA - cost of clean up and replacement of liquid up to the insurance excess - loss of reputation - delay costs	Treatments include: - filling points installed correctly and checked to ensure that bunds remain in place and intact - avoid site filling points wherever possible - site restriction imposed by temporary / permanent fencing - toolbox talks, training, inductions identifying all site hazards	$0					0.0%
SS-65	Risk	All Sub-Stations	Dust complaint	Construction dust impacting local residents, impacting operation of existing / new equipment	EPA intervention, JV / Powerlink fined, reported in news media impacting on reputation	Treatments include: - regular dust monitoring and suppression - pre-start meetings identifying daily hazards on site - toolbox talks, training, inductions identifying all site hazards	$0					0.0%
SS-67	Risk	All Sub-Stations	Damage to contractor assets	Damage to assets, including 3rd party assets that the JV is responsible for due to any of the following: - Fire, collapse, flooding, explosion, impact - Terrorist activity, demonstration, sabotage - Whilst in storage - Whilst in transit	Cost of delay and standby	Treatments include: - include sufficient contingency within the project schedule and budget - use of competent transport company - complete asset register available at short notice for equipment replacement	$0					0.0%
SS-68	Risk	All Sub-Stations	Breakdown of services	Failure of critical services to site electricity, natural gas, water, air / gases, etc.	Cost of delay and standby	Treatments include: - include sufficient contingency within the project schedule and budget - early identification of local distributers that can provide replacement equipment at short notice - maintain a disaster recovery plan - complete asset register available at short notice for equipment replacement	$0					0.0%
SS-69	Risk	All Sub-Stations	Unions	Union issues with labour (especially out of state labour)	Cost of delay and standby	Treatments include: - implementation of robust EBA scheme - early recruitment of key staff positions - adherence to JV recruitment policy and procedures - regular community updates - employment of locals during the project duration to create buy-in	$0					0.0%
SS-73	Risk	All Sub-Stations	Ground water (flooding)	Caused by underground spring, excessive rainfall	Delays to schedule, cost overrun	Treatments include: - emergency plan to include water pumping prior to pre-starts to avoid daily impact - adequate underground investigations to determine potential springs	$0					0.0%
SS-74	Risk	All works	Environmental damage	Damage to the environment by JV from pollution, poor storage/disposal practices, major environmental accident i.e. fire or explosion, destruction of Aboriginal artefacts, destruction of native vegetation, operational failure i.e. leaks, spills, poor housekeeping, sloppy practices, inadequate quality assurance/testing	Impacts include cost for delay, cost of remedial works, penalties and fines, loss of reputation	Treatments include: - implement effective EMP - compliance with design review process - implement effective staff training - establish regular monitoring and audit regime - establish effective insurance	$0					0.0%
SS-75	Risk	All Sub-Stations	Boundary limits	Location of boundary / existing facilities not as expected. This may mean that the layout will not fit in a greenfield area and more brownfield works required.	Additional cost due to potential redesign and / or rework introducing delays to certain stages of the project	Treatments include: - complete dial before you dig at the early stages of the project - complete full Geotech / LIDAR surveys - complete adequate number and location(s) of non-intrusive investigations - investigate all existing service plans nearby	$0					0.0%
SS-80	Risk	All Sub-Stations	Disturbance to public traffic	Vehicle collision, pedestrian access	Impacts include personal injury or death, cost of remedial action, cost for delay and / or loss of reputation	Treatments include: - approved Traffic Management Plan (TMP) - competent traffic controllers - signage installed as per TMP - notification to surrounding community during disturbances - designated pedestrian access	$0					0.0%
SS-81	Risk	All Sub-Stations	Manual handling	Injury; strain, sprains, repetitive movements	Impacts include personal injury or death	Treatments include: - stretching - job rotation - correct lifting techniques - team pull - clear communication	$0					0.0%
SS-82	Risk	All Sub-Stations	Cable termination	Use of knives, gas torch - cuts, abrasions, burns, damages	Impacts include personal injury or death	Treatments include: - cable stripping tools to be used where possible - Kevlar gloves / sleeve to be worn when using self retracting knives - self retracting knives to be used only after risk assessment - hot work permit when using gas torch, fire extinguisher present in area	$0					0.0%

SS-83	Risk	All Sub-Stations	Use of chemicals - conduit glue, jointing compound	Skin irritation	Impacts include personal injury	Treatments include: - SDS / SWMS - appropriate PPE; Gloves, face mask in poorly ventilated areas - wash hands/skin after contact - report irritation - storage in appropriate chemical cabinet	$0					0.0%
SS-85	Risk	All Sub-Stations	Inadequate facilities	Injury / emergency	Uncontrollable outcomes due to lack of emergency equipment	Treatments include: - emergency response plan - first aid kit and trained personnel - engage local medical centre, hospital, clinics - information available on all notice boards (all locations) for location of medical facilities - fire fighting equipment suitable to works and work locations - all equipment regularly inspected and maintained (monthly minimum)	$0					0.0%
SS-86	Risk	All Sub-Stations	Existing fauna	Bites, injury, damages	Impacts include personal injury or death	Treatments include: - awareness - first aid kits in all areas (including vehicle) in prominent and clear positions - trained personnel - local fauna awareness - do not disturb habitats - reporting - check work areas - PPE	$0					0.0%
SS-88	Risk	All Sub-Stations	Spoil stockpile	Erosion into existing pits / run off	Contamination of nearby areas	Treatments include: - stockpile spoil away from any pits where possible - stockpile on high side of excavation - designated stockpile area - adhere to CEMP requirements	$0					0.0%
SS-89	Risk	All Sub-Stations	Outages	Productivity affected by restrictions imposed by existing in-service TBC ? substations	Impacts include higher labour, plant and supervision costs for: - standby awaiting daily Access Permits when working adjacent to live apparatus - 1hr - unable to secure bus outage for connection of new busbars - standby - poor productivity for panel wiring in existing building - commissioning staff	Treatments include: - effective scheduling and work planning - implement effective supervision - implement SWMS to ensure safety - implement effective workplace barricading - implement program flexibility to reallocate resources to other activities	$0					0.0%
SS-90	Risk	All Sub-Stations	Access	Access for cranes or cherry pickers to new bays in existing TBC ? substations is unavailable	Impacts include: - standby of plant and labour awaiting access - cancellation of activity(is) - cost for implementing alternative access	Treatments include: - alternative methodology - implement alternative access	$0					0.0%
SS-91	Risk	All Sub-Stations	Remote locations - communication	Blackspots TBC - Selwyn / Woodstock (also include for TXL - various locations)	Impacts include:	Treatments include:	$0					0.0%
SS-92	Risk	All Sub-Stations	Transport to / from sites losing comms	Journey mgt plans	Impacts include:	Treatments include:	$0					0.0%
SS-93	Risk	All Sub-Stations	Impact of 'other' stakeholders e.g. mines	Potential changes to established processes and procedures	Impacts include:	Treatments include:	$0					0.0%
SS-94	Risk	All Sub-Stations	Labour issues raised by locations	People Risk Register	Impacts include:	Treatments include:	$0					0.0%
STAK-01	Risk	All works	Out of hours work approval	Outages, Works with high audible noise required outside of standard working hours (Monday to Saturday 6:30am - 6:30pm) near sensitive receptors	- Breach of "building work" section of EP act - land owners unhappy with excess noise out of hours - loss of time due to unplanned reschedule of works to standard hours	Treatments include: - Schedule works in the vicinity of sensitive receptors to be completed within general building work hours - Be aware of activities that are outside the recommended dB levels when occurring near a dwelling (e.g. a register with the noise level of each activity to alert which activities must not be done outside standard building hours near dwellings"	$0					0.0%
STAK-03	Risk	All works	Unexpected finds	During clearing or excavations, unexpected finds are exposed.	-Redesign needed to avoid area of unexpected find leading to delays in scheduling OR delays in getting approval from cultural group/archaeologist to continue working after unexpected find has been relocated - Works slow down to allow cultural group / archaeologist to ensure no further finds exposed in surrounding excavations (cultural groups/ archaeologist remain onsite and observe excavations).	Generally dealt with in advance by avoiding known area's of cultural significance Ensure cultural groups are on standby and procedures in place to allow for fast response to unexpected finds CHMP's include detail for preference to relocate unexpected find where possible rather then redesign line	$0					0.0%
STAK-05	Risk	All works	Incident affecting the community	JV could fail to deal with the following effectively after property damage (incl stock and feed) or an environmental incident: - disgruntled landowner - media management - regulatory reporting - environmental activists	Impacts include: - cost for delay - loss of reputation	Treatments include: - prepare & implement effective Incident Response Plan - prepare & implement effective Communications Plan - implement 'lessons learned' workshop following any incident so as to prevent a recurrence - using land agents to follow on response and prevention - options to use E7 as a monitoring and tracking tool	$0					0.0%
STAK-06	Risk	All works	Disgruntled landowner(s)	JV introduces weeds from one location to a weed-free location resulting in weed infestation. Unforeseen / onerous requirements for preventing transfer of weeds and seeds along the corridor. Includes washdowns and requirement for all plant and vehicles to have new weed and seed certificate every time they enter a different property.	Impacts include: - cost for delay - cost for remediation - loss of reputation - failure to get access	Treatments include: - consult Department of Primary Industry and landowners for locations of weed infestation - provide vehicle and plant washdown facilities to prevent transfer of weeds - conduct adequate training of workers for weed management - prepare & implement effective Incident Response Plan - prepare & implement effective Community and Stakeholder Management Plan - implement 'lessons learned' workshop following any incident so as to prevent a recurrence - ensuring access agreements are in place and awareness to construction teams the conditions and restrictions --Negotiate and work with CuString and properties owners for more feasible control of weed and seeds including: stripping of topsoil on access tracks	$0					0.0%
STAK-07	Risk	All works	Disgruntled landowner(s)	JV fails to manage its access through the land appropriately leading to stock loss	Impacts include: - cost for delay - cost for remediation - loss of reputation - failure to get access	Treatments include: - consult with and landowners on access requirements and locations including gate usage and restrictions - provide appropriate access through landowner fences - conduct adequate training of workers on access requirements - prepare & implement effective Incident Response Plan - prepare & implement effective Community and Stakeholder Management Plan - implement 'lessons learned' workshop following any incident so as to prevent a recurrence	$0					0.0%
STAK-08	Risk	All works	3rd Party problems	JV experiences difficulty in dealing with 3rd Parties (Ergon Energy, Glenco, mining lease holders etc) during the construction of the transmission line and Substation connections. Disagreements over design and/or construction compliance	Impacts include: - cost for delay - cost for rework - loss of reputation - failure to get access	Treatments include: - prepare & implement effective Community and Stakeholder Management Plan - leverage off current and previous good relations enjoyed by JV & CuString - actively engage with CuString during design development (safety-in-design workshop, constructability review, design reviews etc) - actively engage with CuString during construction so as to quickly resolve any issues	$0					0.0%
STAK-09	Risk	All Lines	Community Agitation	Landowners or members of local community object to removal of 'valued' trees / land / pasture despite approval to do so	Impacts include: - cost for delay - loss of reputation	Treatments include: - ensure compliance with the CEMP to avoid unsanctioned clearing - ensure workers undergo training in responding to agitated members of the community - communicate to the landowner/community by hosting open forums by CuS (tea, coffee etc) the requirement to remove vegetation for safe clearance to operate CuS	$0					0.0%
STAK-10	Risk	All Lines	Community Agitation	Community opposition to project as a result of untidy sites and surrounds, poor dust control, construction noise or elevated traffic flows	Impacts include: - cost for delay - loss of reputation - show cause notices & infringement notices	Treatments include: - prepare & implement effective Incident Response Plan - prepare and implement an effective Community and Stakeholder Management Plan and appropriate worker training takes place - ensure compliance with the CEMP and appropriate worker training takes place - regular distribution of a project newsletter acknowledging any community issues and how they are being addressed - access agreements - acknowledge the delivery of materials and working hours	$0					0.0%
STAK-11	Risk	All Lines	Community Agitation	Councils opposition to project as a result of undue stress to their community as a result of road use, water use, sewerage use, waste management or elevated traffic flows	Impacts include: - cost for delay - loss of reputation	Treatments include: - prepare & implement effective Local Community Engagement Plan to support local communities - prepare and implement an effective Community and Stakeholder Management Plan and appropriate worker training takes place - regular distribution of a project newsletter acknowledging any community issues and how they are being addressed - regular Council consultation - Support local community initiatives where cost effective to do so e.g. repairs to/paint CWA hall, school seminars on project benefits etc - support of local council facilities	$0					0.0%
STAK-12	Risk	All Lines	Site access during mustering activities	Access for transmission line construction is restricted due to mustering activities	Impacts include: - delay costs - compensation costs to landowners - H&S around tower erection and helicopter mustering	Treatments include: - obtain understanding of mustering activities requirements and arrange construction work around this - if not possible, negotiate access with landholder well in advance of the mustering season - if not possible, negotiate access using alternative helicopter stringing methods - regular communication and consultation of activities	$0					0.0%
STAK-14	Risk	All works	Land acquisition	Refusal of entry by property owners to undertake the required assessments and investigations	Delays and associated reputational and cost impacts	- Dedicated stakeholder management resource on project - Continued stakeholder engagement and management - Fall back on legislative powers	$0					0.0%
STAK-16	Risk	All works	Land acquisition	Community or Council Objection to temporary land use i.e. operational use	JV liability for the approvals delays and associated reputational impacts, this is applied for temp facilities such as laydown areas etc	-Preliminary design investigating land usage and design solutions to minimises land take requirements - Maintain communication and relationship with the council(s), community and other stakeholders during the implementation phase	$0					0.0%

STAK-20	Risk	All works	Land acquisition	Not being able to use crown land for the purposes of the project	Re-working of design, delay and additional costs	- Early identification of land requirements. - A Planning team have been engaged. - A planning strategy has been developed. - Land Manager has been appointed within the CuString team - EIS submission and dealing with Regulator Local, State and Commonwealth	$0					0.0%
STAK-22	Risk	All works	Changes to Baseline Assumptions	Conditions of Approval vary from Baseline Assumptions	redesign necessary resulting in delays impacting construction and delivery	Treatments include: Work collaboratively with CuString to gain EIS, development and planning approvals in addition to providing required support to gain land access - Work with CuS to clarify and accept assumptions - Schedule for development approvals implement and monitor against - Conditions of development to be monitored	$0					0.0%
STAK-24	Risk	All works	Camp approvals	Delays in camp approvals including local and state approvals Land owner unhappy with camp location	Further travel times until camps are commissioned Procurement costs - camp buildings waiting to be mobilised change of camp location resulting in - extra vegetation clearing - new access requirements - additional site works	Treatments include: - Work with CuString to confirm camp locations and gain approvals in EIS - Early communication with landholders to confirm camp location preferences.	$0					0.0%
STAK-25	Risk	All works	Additional land (changed alignment)	JV requires additional land outside approved footprint after contract award. E.g. change of alignment at crossings, near creeks and rivers, artefacts, etc	Additional approvals and land acquisition Minor or major Modification	Attempt to restrict to minor Modification Attempt to design out Covered under Option Deed	$0					0.0%
STAK-25	Risk	All works	Dealing with CuString Customers	Failure to obtain access to Customers Sites to be able to complete interface works at the prescribed time	Impacts include: - cost for delay - loss of reputation	- Planning of works over rail areas - Submitting application at the right time - Regulate progress updates with relevant persons	$0					0.0%
STAK-26	Risk	All works	Dealing with Government Departments	Failure to have a good repour with Government causing a negative impact on the project	Impacts include: - cost for delay - loss of reputation	- Ensuring good liaisons with CuString connections with Government - Ensuring CuString is updated on issues	$0					0.0%
STAK-27	Risk	All works	Approvals	Failure to achieve approvals for construction works over the right of way	Impacts include: - cost for delay - loss of reputation	- Planning of works over rail areas - Submitting application at the right time - Regulate progress updates with relevant persons	$0					0.0%
STAK-28	Risk	All works	Dealing with Media	Failure to have a good repour with Media causing a negative impact on the project	Impacts include: - loss of reputation	Ensuring all media released have been through CuString and JV Media Groups before released to public	$0					0.0%
TL-03	Risk	All Lines	Reliance on 3rd party asset owner's services	Key dependencies on 3rd party asset owner's services such as roads, power lines access, farmland access etc, may delay the works	Impacts include: - cost for delay - cost of labour and plant standby	Treatments include: - prepare and implement an effective Community and Stakeholder Management Plan - prepare and implement an effective 'look ahead' program and provide to affected 3rd parties - ensure appropriate lead times and notification periods are identified in program for all line outages and undergrounding - engage approved ASP's where possible (rather than waiting on Asset Owner) to ensure more control over works	$0					0.0%
TL-05	Risk	All Lines	Tower erection	Cropping restrictions prevent access for conventional tower erection plant such as large mobile cranes	Although a low risk, impacts include: - additional cost for alternative method (e.g. derrick or Gin pole) - delay costs	Treatments include: - obtain understanding of seasonal cropping requirements and arrange construction work around this - if not possible, negotiate access for tower erection plant with landholder well in advance of the cropping season - include above treatments in the base estimate	$0					0.0%
TL-06	Risk	All Lines	Rework - unreasonable superintendent	Superintendent unreasonably rejects work on basis of poor quality	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - plan and implement effective engagement with superintendent - ensure appropriate issue resolution process is implemented (non-contractual) - implement effective relationship training - implement effective commercial management at project level	$0					0.0%
TL-07	Risk	All Lines	Rework - quality control	Poor quality work including earth welding, repair of damaged galvanising, OPGW terminations, concreting, grouting, HV conductor installation/crimping, poor adherence to drawings.	Impacts include: - cost of rework - cost of delay - loss of reputation	Treatments include: - implement effective recruitment that validates previous experience/performance - implement effective quality assurance - implement effective training - apply effective supervision	$0					0.0%
TL-11	Risk	All Lines	Stub damage/loss	Construction plant damages installed steel foundation stubs	Impacts include: - rework cost for new foundation - cost for new stubs (probably local steel)	Treatments include: - apply appropriate flagged barricade around foundation - ensure SWMS address the risk	$0					0.0%
TL-12	Risk	All Lines	Inadequate washdowns	Insufficient washdowns to prevent weed infestation of adjacent properties	Impacts include: - cost to install additional washdown facilities - compensation to landowner for weed infestation	Treatments include: - conduct thorough weed mapping survey at time of tender and appropriately plan for locations of washdown facilities - use of transportable washdown facilities that are easily relocatable	$0					0.0%
TL-13	Risk	All Lines	Wind	Unseasonal high winds disrupt tower erection or stringing operations additional to the base estimate allowance.	Impacts include: - cost of standby for plant and labour	Treatments include: - plan wind affected activities for suitable seasons or time of day - contingency allowance in program and price based on BOM data	$0					0.0%
TL-14	Risk	All Lines	Inaccurate EWP access and craneage pads	Benched site not of suitable size or not compacted correctly	Impacts include: - cost of standby for plant and labour - Incident with plant - program impacts	Treatments include: - planning of individual sites prior to A&C works - Benching and compaction testing regime to be implemented	$0					0.0%
TL-15	Risk	All Lines	Waste removal	Method to be established and item catered for - local engagement			$0					0.0%
TL-16	Risk	All Lines	Comms remote locations	Blackspots - radio communications whilst travelling line			$0					0.0%
TL-17	Risk	All Lines	Travel between locations	Journey management planning to be implemented			$0					0.0%