Appendix 1.19:

20001760 – Strathnairn Zone Substation

20001374 – Strathnairn Feeders

Regulatory proposal for the ACT electricity distribution network 2024–29

Contents

1 Executive Summary

This Business Case addresses the growth of electricity demand in the Ginninderry residential greenfield development and evaluates options into how Evoenergy can meet these needs. The maximum demand in the Ginninderry area is forecast to increase steadily over the next 30 years as load grows in the new and developing suburbs of Strathnairn, Macnamara, as well as at least two subsequent currently unnamed suburbs. The development of this area will include around 15,500 residential dwellings, plus commercial and community facilities.

Evoenergy considered long-term supply options for this area as part of its 2019-24 regulatory proposal. It was determined that the existing zone substation and 11kV feeder network would be capable of meeting forecast demand over the 2019-24 regulatory period, however over the longer term, load growth was of such magnitude that a large zone substation with multiple transformers would likely be required.

The option chosen was a hybrid solution consisting of low-cost feeder extensions coupled with a demand management scheme, involving the procurement of residential battery capacity from Evoenergy customers. Ultimately, this scheme has fallen well below expectations, with around 25% of customers targeted by Evoenergy choosing to participate in the scheme.

Load forecasting indicates that the capacity provided by the demand management scheme combined with the existing 11kV feeder network supporting the Ginninderry District will be insufficient to supply the forecast load and provide N-1 reliability beyond winter 2027.

After consideration of network and non-network options to supply Ginninderry during the 2024-29 regulatory period and beyond, the recommended option is the construction of a new 132/11 kV zone substation in Strathnairn in two stages, coupled with new 11kV feeders to connect to Ginninderry load centres as they develop. Further feeder extensions and expansion of the demand management scheme are not considered credible long-term supply options for Strathnairn and the broader Ginninderry development, in light of the scale and pace of the forecast demand growth.

Stage 1 would involve the development of the zone substation site, the installation of one 30/55 MVA transformer and one 11 kV switchboard, with space provided for two additional transformers and two additional 11 kV switchboards. Stage 1 is proposed to commence in winter 2024 and be completed by winter 2027.

Stage 1 would also involve the construction of a feeder to connect to the Strathnairn load centre. Future 11 kV feeders from Strathnairn Zone Substation will inter-tie with feeders from Latham Zone Substation, with the opportunity to offload Latham onto Strathnairn Zone Substation.

Stage 2, comprising installation of a second 30/55 MVA transformer and second 11 kV switchboard is proposed to be completed by 2032.

Evoenergy also investigated the option of a grid battery. While this option would incur lower expenditure during the 2024-29 regulatory period (if sized in proportion to the forecast capacity shortfall during this period), the load growth beyond the regulatory period through to 2050 is such that a grid battery is not considered to be a prudent, efficient or sustainable medium to long term solution.

The assessment of the options considered to address the need is provided in Table 1 below.

Table 1 – Options assessment and preferred option identification

Ref	Option	Cost^~ (million)	NPV^* (million)	Evaluation Summary
0	Utilise existing network infrastructure	$0	$0	Not selected as not technically feasible
1	Grid battery only	$26.90	$488.29	Not selected due to lower NPV
2	Construct new Strathnairn Zone Substation, including two 30/55MVA transformers and associated 132/11kV infrastructure 11kV feeder works	$20.75	$491.13	**Recommended**. Highest NPV technically feasible option

^FY23/24 dollars, excluding corporate overheads, excluding contingency and excluding GST
~Only includes expenditure for the 2024-2029 regulatory period
**NPV is relative to base case – utilise existing network infrastructure.*

The recommended option based on the options evaluation presented in this report is Option 2, as this meets the requirements of the need, is technically and economically feasible, and has the highest NPV. This option is proposed to be fully implemented by winter 2027.

A preliminary cost estimate for the recommended option is **$19,036,436 in FY23/24 dollars, excluding corporate overheads, excluding contingency, and excluding GST**.

A preliminary cost estimate for the associated Strathnairn 11kV feeders is **$1,709,324 in FY23/24 dollars, excluding corporate overheads, excluding contingency, and excluding GST**

2 Identified Need

In 2016, the ACT Government's Suburban Land Agency (SLA) and Riverview Developments Pty Ltd formed a partnership to develop an innovative master-planned community spanning the ACT and NSW border in West Belconnen, known as the Ginninderry Joint Venture.

Ginninderry commences just beyond the suburbs of Holt and Macgregor. It is 13 kilometres from Civic and 6 kilometres from Belconnen Town Centre. It includes the new suburbs of Strathnairn and Macnamara and two more as yet unnamed suburbs in the ACT and over the border in NSW as shown in Figure 1 below.

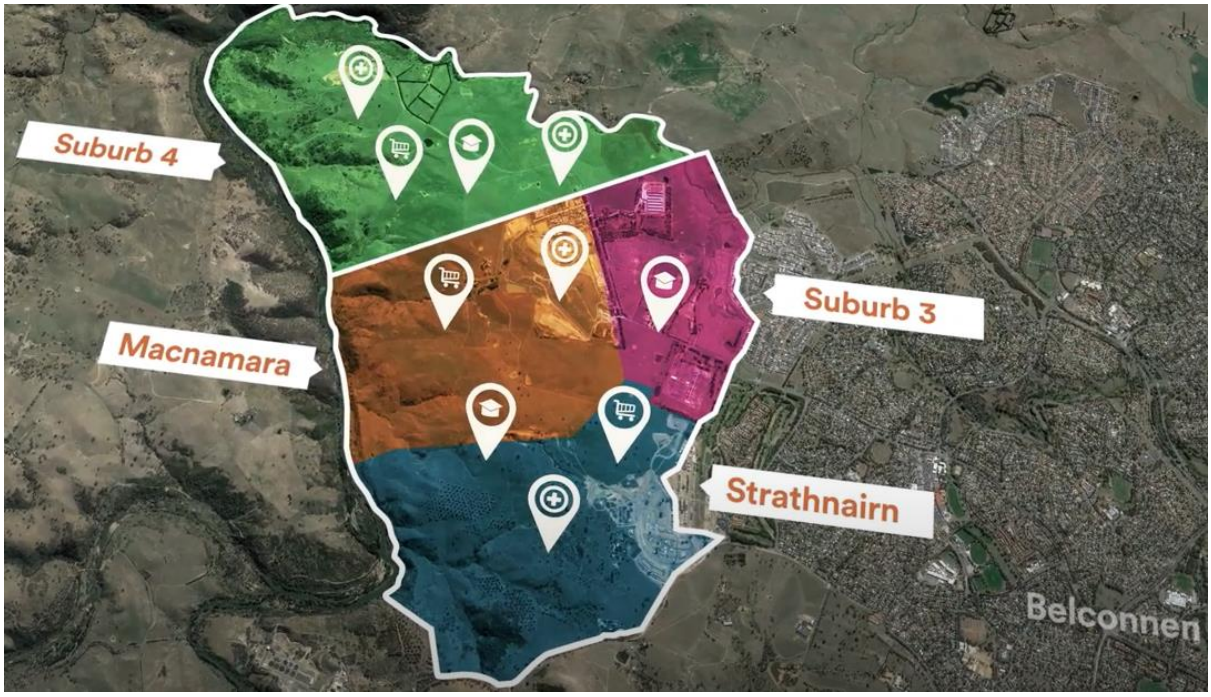

Figure 1 Ginninderry precinct showing the four development suburbs

The original Master Plan expected approximately 30,000 people to ultimately live in Ginninderry by 2050, distributed among an estimated 11,500 dwellings supported by shopping centres, schools and community facilities. The distribution and staging of this development was as follows:

- **Strathnairn** - approximately 4,000 dwellings, commencing from 2018
- **Macnamara** - approximately 3,800 dwellings, commencing from 2026
- **Unnamed suburbs** - approximately 3,700 dwellings, commencing in approximately 2032

Development forecasts have since been revised upwards to an estimated 40,500 people and 16,000 dwellings.

The first homes in Strathnairn were completed in 2020, with 500 dwellings completed as at June 2022. The rate of growth in new dwellings in the 2021/22 Financial Year was the highest in Australia, at 62.9 per cent. Land releases for Macnamara commenced in 2022, with construction scheduled for 2026/27.

Ginninderry has been certified by the Green Building Council of Australia as a 6 Star Green Star Community. Rooftop PV systems are mandatory on all detached dwellings and terraced townhouses in Ginninderry (ranging in size from 1.5 kW to 4.0 kW).

On its own, rooftop PV will decrease summer maximum demand but without associated battery storage will have no impact on winter peak demand. However, over the medium to long-term, as battery prices are likely to significantly decline, it is expected that many customers with a PV system will invest in a BESS.

Evoenergy considered long-term supply options for Ginninderry over the 2019-24 regulatory period.

It was determined that remaining capacity from the existing 11kV feeder network and the Latham and Belconnen Zone Substations was sufficient to service forecast load over the 2019 to 2024 regulatory control period, however over the longer term, load growth was of such scale that a large zone substation with multiple transformers was likely to be the only viable solution.

Supply to Strathnairn over the 2019-24 regulatory period was provided primarily via the Macrossan and Latham feeders (which connect to Latham zone substation) coupled with a demand management scheme including incentive payments for up to 463 customers to install residential batteries with the purpose of reducing peak demand on the existing 11kV feeders. Evoenergy also initiated the extension of the 11 kV Weir feeder (PN 20001761) to provide supply from 2024/25.

However, takeup of the demand management scheme has fallen significantly below expectations. In a trial planned to incentivise 75 residential batteries in Ginninderry stage 1, only 19 residences (around 25%) accepted the offer and installed batteries, despite generous battery rebates and extensive customer engagement. As such, expansion of this scheme is not considered a credible long-term supply option for Strathnairn and the broader Ginninderry precinct.

Evoenergy has been negotiating with the SLA to secure a suitable block of land for the Strathnairn Zone Substation, located in the proximity of TransGrid's 330/132 kV Stockdill Substation.

The project will be subject to the Regulatory Investment Test for Distribution (RIT-D). Evoenergy is proposing to commence the RIT-D in 2024.

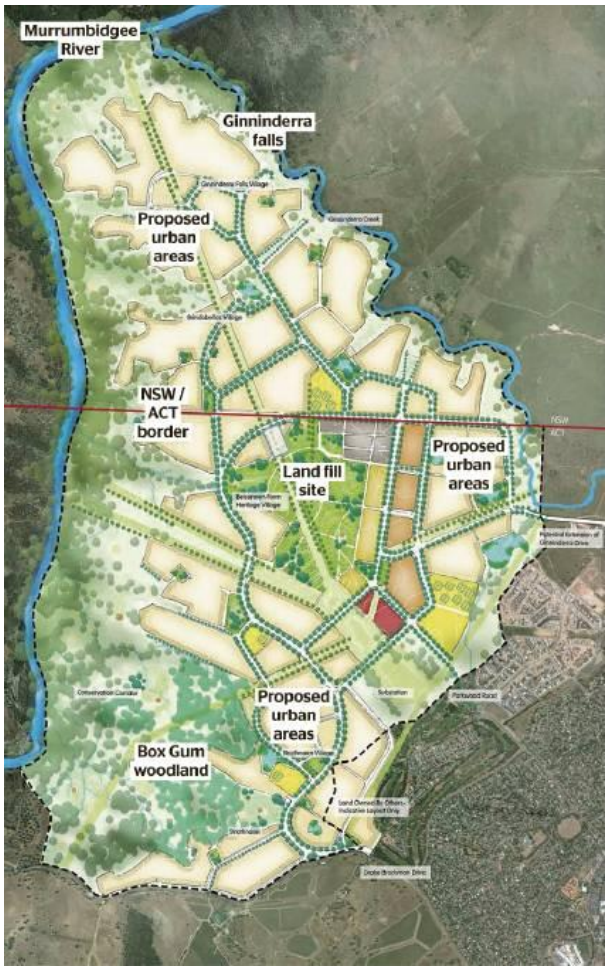

Figure 2: Indicative geographic plan for the Ginninderry development

1.1.1 Load Growth

At an expected fill rate of approximately 425 dwellings per annum, the Ginninderry load is forecast to grow steadily at approximately 1.2 MVA pa on average over the next 30 years. Additionally, the proposed future transfer of 10.6 MVA load associated with the Lower Molonglo Water Quality Control Centre from Latham to Strathnairn Zone Substation[1] will result in a cumulative load of 45 MVA by around 2050.

Evoenergy's load forecasting indicates cumulative new demand in the Ginninderry area will reach 8.9 MVA from 2024, rising to 14.8 MVA in 2029 and 17.8 MVA by 2032.

The capacity of the existing the 11 kV feeder network (including the Weir feeder extension) combined with the demand management scheme will be insufficient to supply the forecast load beyond summer 2027.

Evoenergy's planning standards are set to ensure that peak demand can be met with an appropriate level of backup should a credible contingency event occur. A credible contingency event is the loss of a single network element that occurs sufficiently frequently, and has such consequences, as to justify the DNSP to take prudent precautions to mitigate. This is commonly referred to as an N-1 event.

[1] Refer Technical Study Lower Molonglo East and West Feeders 19.12.16.

3 Options Outline

Evoenergy has considered network and non-network options to meet forecast demand in the Ginninderry District, including scope to defer investment. The following options have been considered to meet the investment need:

- Option 0 – Utilise existing network infrastructure (Base Case)
- Option 1 – Grid battery only
- Option 2 – Construct new Strathnairn Zone Substation

The Base Case option involves maximising load-shifting through reconfiguration of the existing feeder network.

There are two existing feeders supplying the Ginninderry area, namely Macrossan and Latham. In addition, the Weir feeder extension is currently under construction and will provide supply from 2025.

Table 2 outlines how Evoenergy proposes to allocate the forecast load growth within this existing network, noting the individual circumstances applying to each feeder in terms of geographic location, interconnectivity and proximity to new loads. Given that load growth is forecast to continue from 2029 at around 1.2MVA per year, the forecasting period has been extended to 2032 to provide wider context for efficient and prudent investment to supply Strathnairn and the wider Ginninderry precinct over the medium to long term.

Table 2 – Allocation of new loads to existing feeder network

Feeder Name	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Macrossan	0.7	0.5	0.9	1.2	-	-	-	-	-			
Latham	0.7	0.5	1.2	2.0	0.0	-	-	0.5	0.5	0.8	0.2	0.5
Weir	-	-	-	1.2	2.5	-	1.4	0.5	0.5	0.8	0.2	0.5
Additional Load (MVA)	1.4	1.1	2.0	4.4	2.5	-	1.4	1.0	1.0	1.6	0.4	1.0
Cumulative Load (MVA)	**1.4**	**2.5**	**4.5**	**8.9**	**11.4**	**11.4**	**12.8**	**13.8**	**14.8**	**16.4**	**16.8**	**17.8**

Evoenergy additionally investigated the potential for load transfer from Weir to O'Loghlen feeder during the regulatory period. The scope for load transfer was determined to be limited as a result of other projects on the feeder including the Net Zero project loads coming online and the anticipated growth in demand from electric vehicles.

Network capacity analysis confirms that load transfer can optimise the utilisation of these feeders, but will be insufficient to support the loads, with a shortfall in capacity on firm ratings emerging in winter 2023 and on thermal ratings in winter 2024.

Table 3 below highlights the impact of adding the future load onto the existing feeders. The maximum load supplied by each feeder as a percentage of its firm rating, is shown for

summer and winter. Yellow denotes load above the firm rating, red denotes load above firm rating. Exceedances of thermal limits can be observed for Latham feeder from winter 2024 and on Weir feeder from winter 2027.

Table 3: Feeder loadings in base case

Feeder	Summer Firm	Summer Thermal	Winter Firm	Winter Thermal	2021 Summer	2021 Winter	2022 Summer	2022 Winter	2023 Summer	2023 Winter	2024 Summer	2024 Winter	2025 Summer	2025 Winter	2026 Summer	2026 Winter	2027 Summer	2027 Winter	2028 Summer	2028 Winter	2029 Summer	2029 Winter	2030 Summer	2030 Winter	2031 Summer	2031 Winter	2032 Summer	2032 Winter
Macr'n	4.4	5.9	5.0	6.7	2.9	4.0	3.3	4.6	3.9	5.4	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6	4.7	6.6
Latham	4.4	5.9	5.0	6.7	2.1	2.9	2.5	3.5	3.4	4.6	5.0	6.8	5.7	7.8	5.7	7.8	5.7	7.8	6.1	8.3	6.4	8.8	7.0	9.6	7.2	9.8	7.5	10.3
Weir	4.4	5.9	4.9	6.6	2.1	3.4	2.1	3.4	2.1	3.4	2.8	4.4	3.8	5.9	3.8	5.9	4.8	7.3	5.1	7.7	5.4	8.2	6.0	9.0	6.1	9.2	6.5	9.7
Expected Unserved Energy (kWh)									0		23		21584		21584		21584		75595		210100		636216		760550		1212397	
Value of Unserved Energy									$3		$755		$711,308		$711,308		$711,308		$2,491,229		$6,923,853		$20,966,488		$25,063,938		$39,954,551	

The Base Case would result in Evoenergy breaching its Distribution Network Augmentation Standards and thus its obligation to provide a reliable and secure power supply.

Table 4: Power and energy required over thermal ratings of the existing feeders

Power & Energy over Thermal Ratings	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
100% Load Forecast (assume no demand reduction)										
Maximum daily power above thermal rating (MW)	0.0	0.0	1.2	1.2	1.2	1.6	2.1	2.9	3.1	3.6
Maximum daily energy above thermal rating (MWh)	0.0	0.0	1.6	1.6	2.0	6.2	12.6	25.2	28.2	38.1
Daily hours above thermal rating (hrs)	0	0	79	79	83	220	422	891	992	1336

This option utilises a grid battery to supply the load growth that is in excess of the existing network's thermal capacity. A grid battery, although more expensive than a traditional network solution on a per MVA basis, has advantages over a traditional network solution. A grid battery is modular and also able to be redeployed, meaning it can represent a more economic option in an environment of demand uncertainty or where demand is expected to increase for a short period and then decline.

Table 5: BESS requirements to alleviate load over thermal rating

BESS required	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
MWh capacity required	0.0	0.0	1.6	0.0	0.5	3.3	3.9	11.8	3.0	16.6
Estimated cost ($m)[2]	-	-	1.03	-	0.30	2.16	2.56	7.80	2.01	11.04

The estimated total cost for 20.3MW/40.5MWh BESS is **$26.90m excluding corporate overheads, contingency and GST**. This estimate does not contain provision for ongoing battery maintenance or the purchase of land to facilitate the implementation of a grid battery solution.

This option proposes to meet future demand in the Strathnairn and broader Ginninderry area through the construction of a new 132/11 kV zone substation in Strathnairn in two stages:

- **Stage 1** – establish zone substation site with all earthworks, earthing, fencing, and 132 kV structure and busbar, plus the installation of one 132/11 kV 30/55 MVA transformer and one 11 kV switchboard. Space will also be provided for a future two additional transformers and two additional 11 kV switchboards. Completion is targeted for winter 2027.
- **Stage 2** – install second 132/11 kV 30/55 MVA transformer and second 11 kV switchboard. Completion is targeted for 2032.

A preliminary cost estimate for Option 2 for the 2024-2029 regulatory period is **$19,036,436 in FY23/24 dollars, excluding corporate overheads, excluding contingency, and excluding GST**. The proposed timing of the expenditure for Option 2 is shown in Table 6 below.

Table 6: Allocation of expenditure by year

Option 2	2024/25	2025/26	2026/27	2027/28	2028/29
Construct new Strathnairn Zone Substation	939,728	9,490,237	9,213,122	1,102,672	-

Option 2 is also associated with the installation of new feeders from Strathnairn substation to supply the new suburbs as they grow. Approximately 3.2km of 3C/400mm^2 Aluminium XLPE cable is required to construct these 11kV feeders. The associated cost is **$1,709,324 in FY23/24 dollars excluding corporate overheads, contingency and GST**.

[2] Based on Evoenergy's BESS estimated cost of $644 / kWh.

4 Options Evaluation

The commercial evaluation of the options identified to meet the need is set out in Table 7 below. Full financial details appear in Appendix A.

Table 7 – Evaluation Summary and Recommended Option

Ref	Option	Cost^~ (million)	NPV^* (million)	Evaluation Summary
0	Utilise existing network infrastructure	$0	$0	Not selected as not technically feasible
1	Grid battery only	$26.90	$488.29	Not selected due to lower NPV
2	Construct new Strathnairn Zone Substation, including two 30/55MVA transformers and associated 132/11kV infrastructure 11kV feeder works	$20.75	$491.13	**Recommended**. Highest NPV technically feasible option

^FY23/24 dollars, excluding corporate overheads, excluding contingency and excluding GST
~Only includes expenditure for the 2024-2029 regulatory period
**NPV is relative to base case – utilise existing network infrastructure.*

5 Recommendation

The recommended option based on the options evaluation presented in this report is Option 2, as this meets the requirements of the need, is technically and economically feasible, and has the lowest cost (least negative NPV).

The 55 MVA firm capacity delivered by the Strathnairn Zone Substation will underpin growth and development within Strathnairn and the broader Ginninderry District for up to 30 years.

It can be implemented in time to meet the project needs as identified and will add to Evoenergy's regulated asset base. The asset will have an estimated economic life of 50 years.

Although installation of a grid battery would involve lower expenditure during the 2024-29 regulatory period, the load growth beyond the regulatory period through to 2050 is such that a grid battery is not considered to be a prudent, efficient or sustainable medium to long term solution.

The preliminary cost estimate for the recommended option for the 2024-2029 period is **$19,036,436 in FY23/24 dollars, excluding corporate overheads, excluding contingency, and excluding GST**.

The preliminary cost estimate for the associated Strathnairn 11kV feeders for the 2024-2029 period is **$1,709,324 in FY23/24 dollars, excluding corporate overheads, excluding contingency, and excluding GST.**

6 Appendix A

The below cost estimates are in FY21/22 dollars and have been escalated to 23/24 dollars for the submission.

A.1 Cost Estimate – Option 2:

Project Cost Estimate

Project Number	20001760
Project Name	Strathnairn Zone Substation
Project Manager	-
Program	AUGEX

Labour

[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
OT Hours	Hours	Rate	Total
Field OT Labour	-		-
Field Labour Total			41,226.23
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
[redacted]			
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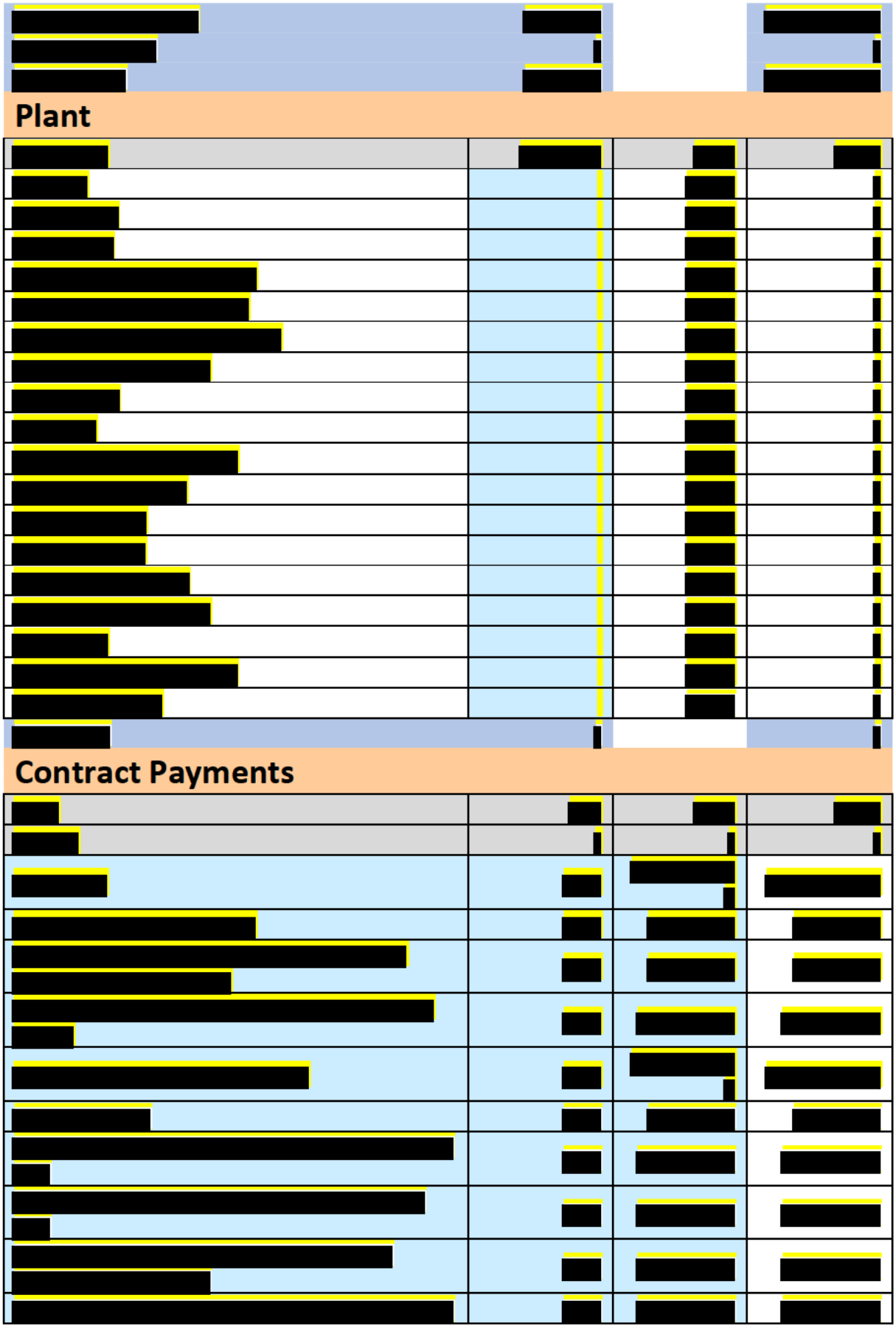

Plant
Contract Payments

[redacted]

Materials

[redacted]

Overheads

[redacted]

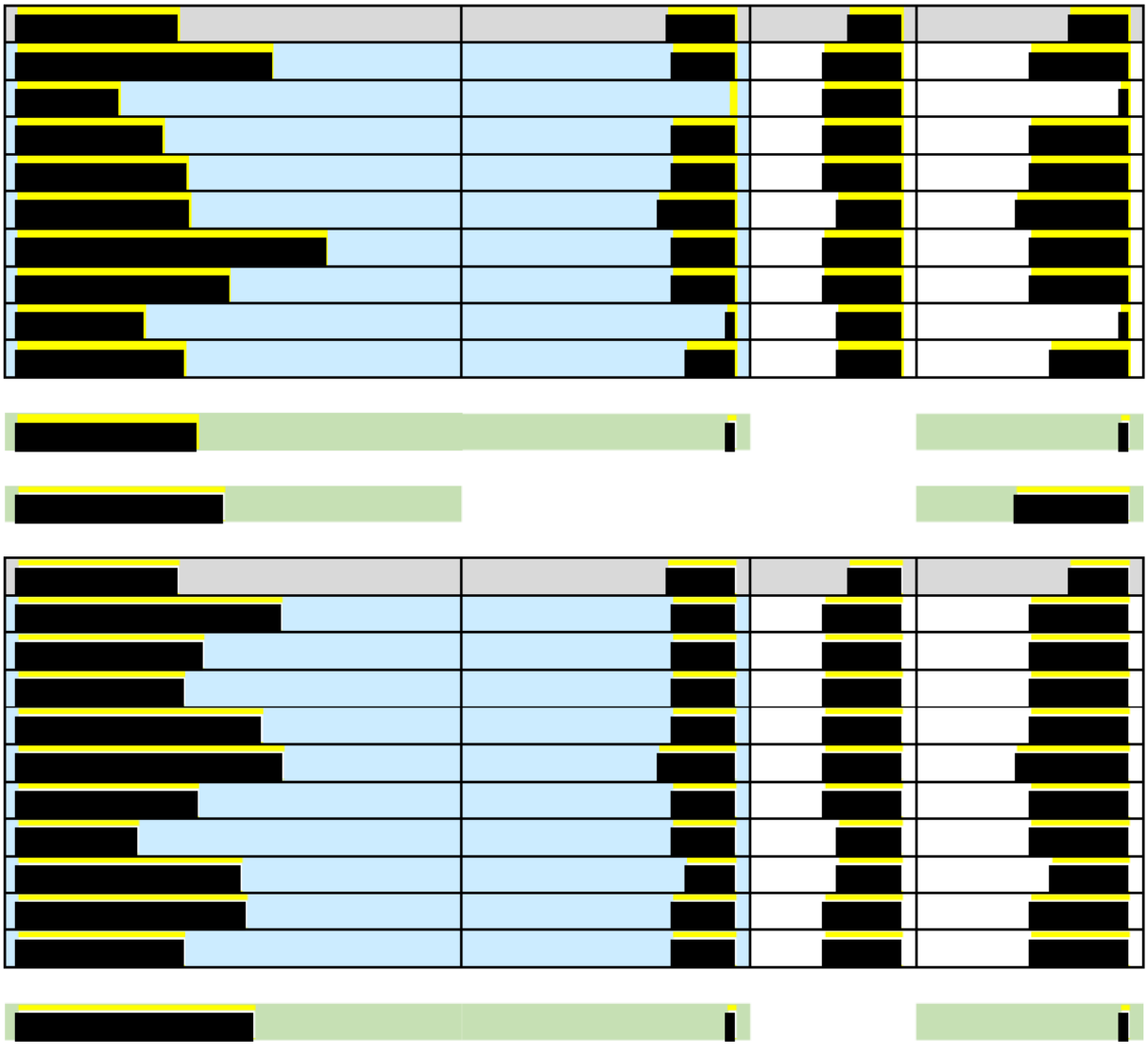
Summary

Summary	Total
Labour	1,417,132.31
OT Labour	-
Plant	-
Contract Payments	16,262,800.00
Materials	-
Total Direct Cost	**17,679,932.31**
Cost Centre Overhead	396,797.05
Corporate Overhead	4,066,384.43
Total Overhead Cost	**4,463,181.48**
Total Cost	**22,143,113.79**

Project Cost Estimate

Project Number	20001374
Project Name	Strathnairn feeders
Project Manager	
Program	AUGEX

Labour



Plant

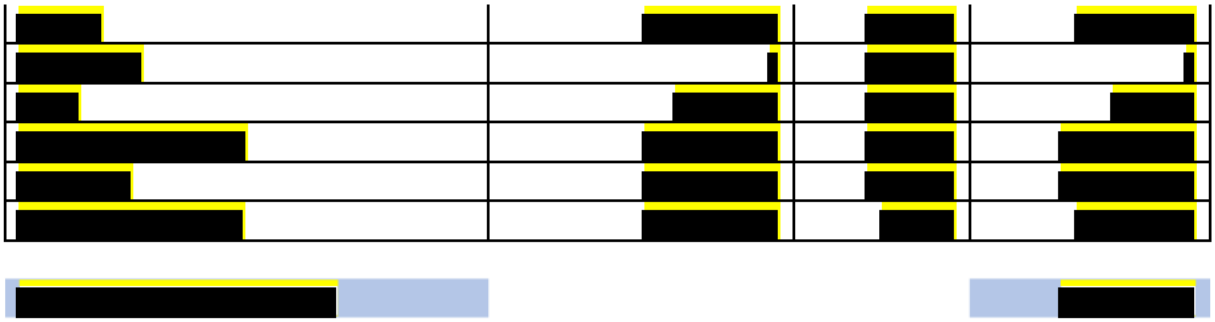
Contract Payments

Materials

Item Description	Qty	Rate	Total
[redacted]			

Item Description	Qty	Rate	Total
			-

Overheads



Summary

Summary	Total
Labour	107,781.41
OT Labour	-
Plant	1,380.00
Contract Payments	623,600.00
Materials	637,150.23
Total Direct Cost	**1,369,911.64**
Cost Centre Overhead	29,100.98
Corporate Overhead	387,078.43
Total Overhead Cost	**416,179.41**
Total Cost	**1,786,091.05**

A.2 NPV calculation:

NPV has been calculated over a 40-year time horizon. The tables below capture the first 20 years of the NPV assessment period. The final NPV at the end of 40 years is in the highlighted cell.

Option 0 -

Period	FY 24/25	FY 25/26	FY 26/27	FY 27/28	FY 28/29	FY 29/30	FY 30/31	FY 31/32	FY 32/33	FY 33/34	FY 34/35	FY 35/36	FY 36/37	FY 37/38	FY 38/39	FY 39/40	FY 40/41	FY 41/42	FY 42/43
Project Costs - Capex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Costs - Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benefits	-711,308	-729,091	-747,318	-2,682,781	-7,642,638	-23,721,657	-29,066,484	-47,493,406	-48,680,741	-49,897,759	-51,145,203	-52,423,833	-53,734,429	-55,077,790	-56,454,735	-57,866,103	-59,312,756	-60,795,574	-62,315,464
Tax Effect	160,044	217,394	222,828	659,675	1,920,802	5,910,571	8,319,083	12,866,003	14,515,172	14,878,051	15,250,003	15,631,253	16,022,034	16,422,585	16,833,150	17,253,978	17,685,328	18,127,461	18,580,647
Net cash flow	-551,264	-511,697	-524,490	-2,023,107	-5,721,836	-17,811,086	-20,747,401	-34,627,403	-34,165,569	-35,019,708	-35,895,201	-36,792,581	-37,712,395	-38,655,205	-39,621,585	-40,612,125	-41,627,428	-42,668,114	-43,734,816
PV of net cash flow	-537,186	-473,488	-460,853	-1,688,010	-4,533,380	-13,400,084	-14,822,150	-23,490,801	-22,008,829	-21,421,565	-20,849,971	-20,293,628	-19,752,131	-19,225,082	-18,712,097	-18,212,800	-17,726,825	-17,253,818	-16,793,432
Cumulative PV	-537,186	-1,010,673	-1,471,527	-3,159,537	-7,692,918	-21,093,002	-35,915,152	-59,405,953	-81,414,783	-102,836,348	-123,686,319	-143,979,947	-163,732,078	-182,957,160	-201,669,257	-219,882,057	-237,608,882	-254,862,700	-271,656,133
NPV	-507,755,191																		

Option 1 -

Period	FY 24/25	FY 25/26	FY 26/27	FY 27/28	FY 28/29	FY 29/30	FY 30/31	FY 31/32	FY 32/33	FY 33/34	FY 34/35	FY 35/36	FY 36/37	FY 37/38	FY 38/39	FY 39/40	FY 40/41	FY 41/42	FY 42/43
Project Costs - Capex	-1,032,751	0	-314,311	-2,324,341	-2,826,048	-8,827,943	-2,328,396	-13,123,405	0	0	0	0	0	0	0	0	0	0	0
Project Costs - Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benefits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tax Effect	5,809	13,264	16,306	30,922	63,294	135,340	213,179	310,355	397,628	402,353	382,235	363,124	344,967	327,719	311,333	295,766	280,978	266,929	253,583
Net cash flow	-1,026,942	13,264	-298,006	-2,293,419	-2,762,754	-8,692,602	-2,115,218	-12,813,050	397,628	402,353	382,235	363,124	344,967	327,719	311,333	295,766	280,978	266,929	253,583
PV of net cash flow	-1,000,716	12,274	-261,849	-1,913,550	-2,188,915	-6,539,837	-1,511,133	-8,692,214	256,145	246,119	222,024	200,288	180,679	162,990	147,033	132,639	119,653	107,939	97,372
Cumulative PV	-1,000,716	-988,442	-1,250,291	-3,163,841	-5,352,756	-11,892,594	-13,403,726	-22,095,940	-21,839,796	-21,593,676	-21,371,652	-21,171,365	-20,990,686	-20,827,695	-20,680,662	-20,548,023	-20,428,370	-20,320,431	-20,223,060
NPV	-19,466,277																		

Option 2 -

Period	FY 24/25	FY 25/26	FY 26/27	FY 27/28	FY 28/29	FY 29/30	FY 30/31	FY 31/32	FY 32/33	FY 33/34	FY 34/35	FY 35/36	FY 36/37	FY 37/38	FY 38/39	FY 39/40	FY 40/41	FY 41/42	FY 42/43
Project Costs - Capex	-939,728	-9,727,493	-9,679,536	-1,187,457	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Project Costs - Opex	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Benefits	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tax Effect	5,286	66,787	192,613	280,497	293,528	281,078	267,024	253,673	240,989	228,940	217,493	206,618	196,287	186,473	177,149	168,292	159,877	151,883	144,289
Net cash flow	-934,442	-9,660,706	-9,486,923	-906,960	293,528	281,078	267,024	253,673	240,989	228,940	217,493	206,618	196,287	186,473	177,149	168,292	159,877	151,883	144,289
PV of net cash flow	-910,579	-8,939,319	-8,335,878	-756,736	232,560	211,467	190,764	172,088	155,241	140,042	126,332	113,964	102,807	92,742	83,662	75,472	68,083	61,417	55,405
Cumulative PV	-910,579	-9,849,898	-18,185,776	-18,942,512	-18,709,952	-18,498,485	-18,307,720	-18,135,632	-17,980,391	-17,840,349	-17,714,017	-17,600,053	-17,497,246	-17,404,504	-17,320,842	-17,245,370	-17,177,288	-17,115,870	-17,060,466
NPV	-16,629,855																		