Business Case – Capital Expenditure (Capex)

South West Pipeline Expansion – Iona 570 TJ/d injection

Service Provider: APA VTS Australia (Operations) Pty Limited
Asset: Victorian Transmission System (VTS) (i.e. APA GasNet System as defined under the Service Envelope Agreement (SEA))
Business Case: 601

1 Project Approvals

TABLE 1: BUSINESS CASE – PROJECT APPROVALS

Prepared By	Sheila Krishnan, Manager Asset Capacity Planning
Reviewed By	Daniel Tucci, Asset Manager
Approved By	Mark Fothergill, General Manager Infrastructure Engineering

2 Project Overview

TABLE 2: BUSINESS CASE – PROJECT OVERVIEW

Description of Issue/Project	AEMO's Gas Statement of Opportunities (GSOO) and Victorian Gas Planning Report (VGPR) have predicted a shortfall in gas supplies in the Victorian Transmission System (VTS) to meet winter demands as early as 2023. This shortfall is driven by the declining gas supplies from Longford. APA is proposing to expand the South West Pipeline (SWP) to allow more gas from Lochard's Underground Gas Storage (UGS) facility to be injected into the VTS during winter period to reduce the risk of supply shortfall in the VTS during winter in the short term. Iona's injection capacity is currently 530 TJ/d but is constrained by the SWP to 445 TJ/d. Once the Western Outer Ring Main (WORM) is completed in 2023, Iona will be able to inject up to 468 TJ/d into the VTS. Lochard has achieved FID in December 2020 to further increase their injection capacity to 570 TJ/d by 1 January 2023. The SWP will be expanded to enable Iona's injection capacity at 570 TJ/d, that is 102 TJ/d (post WORM) of additional gas supply capacity to the VTS during the winter peak period.
Options Considered	Option 1: Do Nothing. Option 2: Install compression on SWP. Compression at various locations on the SWP were considered Option 3: Looping of the South West Pipeline.

Proposed Solution	The Preferred Solution (Option 2) is to install two compressor stations on the SWP at Stonehaven and Pirron locations. Works are also required to the existing Winchelsea compressor to de-bottleneck high pressure drops across the suction and discharge headers due to higher flows. In addition, an upgrade of Brooklyn City Gate will be required to enable increased flowrate into the Melbourne transmission network. Due to the uncertainty in the future supply-demand of the VTS and declining demands due to electrification of domestic loads, the SWP expansion, will mitigate the shortfall in gas supply in the near term, has a risk of becoming redundant over time. APA is also proposing to stage the two compressor stations, that is, Stonehaven in 2024 and Pirron in 2025, the latter later as APA will need time to secure land at that site.
Estimated Cost	**$90.93 m**
Consistency with the National Gas Rules (NGR)	APA VTS considers that the above presented capital project meets the criteria of Rule 79(2)(c)(ii) and (iv), that is, the South West Pipeline investment is required for integrity of services, and to maintain the capacity to meet existing levels of demand for services, hence the capital expenditure is justified as conforming capital expenditure.
Stakeholder Engagement	APA has had regular engagement with stakeholders related to this project for a number of years. The stakeholders affected by this project are: • Australian Energy Market Operator (AEMO) • Victorian Market Participants • Lochard Energy

3 Background

AEMO's Gas Statement of Opportunities (GSOO 2021) and Victorian Gas Planning Report (VGPR 2021) have forecasted that there would be a shortfall in gas supplies into the VTS to meet its demands as early as 2023. The shortfall is mainly driven by declining gas supplies from Longford. Port Kembla LNG Terminal (PKGT) was expected to be constructed by 2023 to mitigate the shortfall in gas supplies in the VTS. However, PKGT has not achieved Financial Investment Decision (FID) to date and may not be ready by winter 2023. Without PKGT, a shortfall of 100 TJ/d is predicted to occur in a winter peak condition in 2023 and subsequent winters, hence posing a threat to system security in the VTS.

Figure 1 below is extracted from the GSOO 2021 (Figure 28, page 56) which graphically shows the supply-demand forecasted Southern States. There is a significant downward trend in maximum southern production (thick red line) with the decline of Longford. The red dotted line takes into account the capacity that is available from storages, accounting for pipeline constraints, such as the South West Pipeline which currently constrains the amount which Iona UGS can inject into the system. The orange solid line shows the capacity available after the construction of the PKGT. Without PKGT, the shortfall in gas supply is evident from winter 2023.

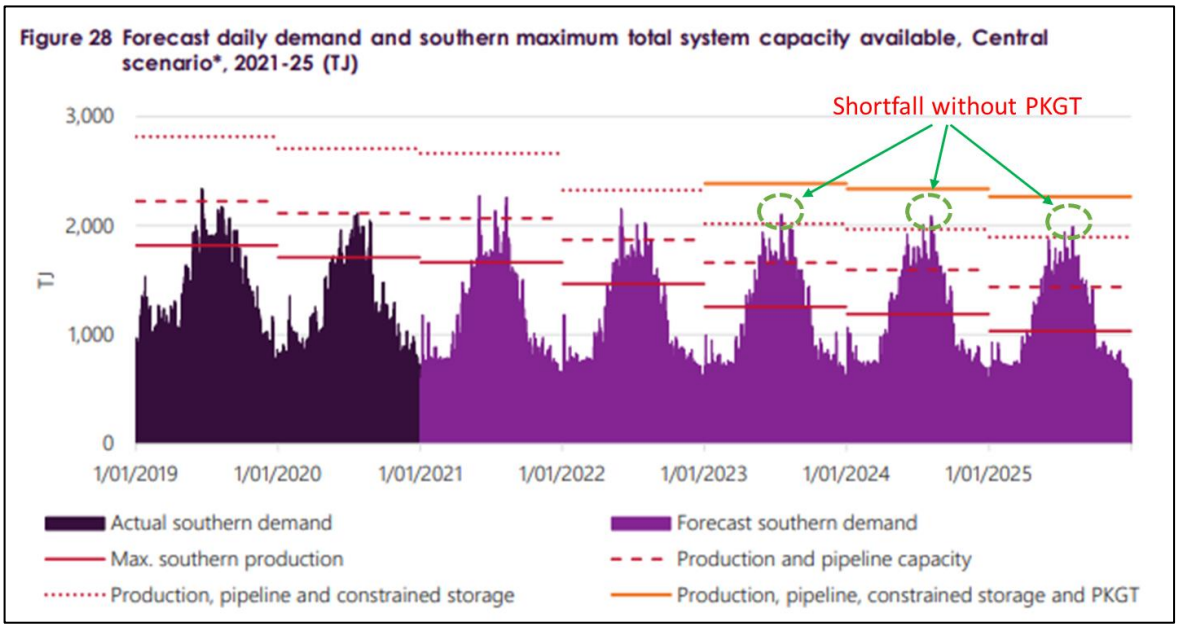


Figure 1: Forecast Supply-Demand 2021-2025, source GSOO 2021

Following AEMO's publication in March 2021, APA reached FID in the expansion of the Moomba – Sydney Pipeline (MSP) and the South West Queensland Pipeline (SWQP), known as the East Coast Grid (ECG) Expansion. The project increases the capacity of the ECG by 25%, allowing more gas to be accessed from Wallumbilla and Moomba to flow to the NSW and Victoria. The project is staged:

- Stage 1 will be commissioned in March 2023 and increases the MSP capacity by 29 TJ/d, and SWQP by 50 TJ/d[1],
- Stage 2, subject to shippers contracting, will be commissioned in March 2024, increases the MSP by a further 90 TJ/d, and SWQP by 57 TJ/d.

By removing PKGT supply in Figure 1 and replacing with the ECG Stages 1 & 2 (assuming MSP expansion only to bring gas to Victoria), the resultant forecast is shown in Figure 2 below.

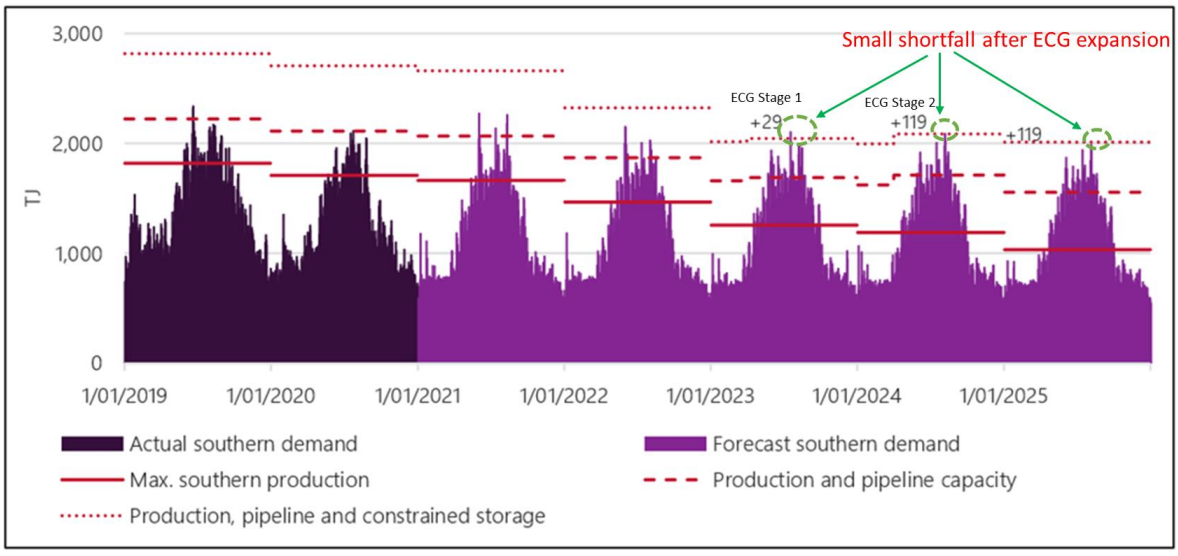


Figure 2: GSOO Supply Demand Forecast 2021-2025 adjusted with ECG Expansion (no PKGT)

[1] MSP current southbound capacity is 446 TJ/d. SWQP westbound capacity is 405 TJ/d.

There appears to be sufficient supply capacity to meet most of the demand except for a small number of winter peak days from 2023. A small shortfall in winter 2023 of ~70 TJ/d is evident, and supply would be very tight in the following winters, assuming that the demand forecasts are as predicted.

APA commissioned Oakley Greenwood (OGW)[2] to undertake a study on the supply-demand forecast of the southern states. OGW's modeling took AEMO's GSOO forecasts into consideration and updated it with more recent events since the GSOO publication in March 2021. These events include APA's expansion of the East Coast Grid and large customer curtailment in Altona and factored in the impact of VTS demand due to carbon reduction initiatives. The decarbonisation of Victoria's gas networks includes the introduction of renewable gases such as hydrogen, biomethane and other pathways such as electrification, which is expected to reduce gas demands in the VTS over time.

The OGW study concluded that there were sufficient gas supplies to meet all demands in the southern states in 2025 assuming PKGT is constructed. While there would be supply shortfall from 2030, this shortfall would not be as large as predicted by the GSOO, when taking into account the demand reduction due to decarbonization targets in Victoria.

In this business case, APA is proposing to reduce the risk of supply short fall in the short term by expanding the South West Pipeline. Without PKGT achieving FID to date, SWP expansion would allow more Iona UGS gas to be accessed which is currently constrained by the SWP capacity.

However, with growing decarbonization initiatives such as electrification and eventual introduction of H2 into the Victorian distribution networks, APA's concerns are that any augmentation on the SWP may become redundant assets as natural gas demand gradually reduces over time. The next GSOO update is due in March 2022 following market consultation.

South West Pipeline and Port Campbell/Iona

The South West Pipeline (SWP) is a bi-directional pipeline that is used to supply gas from the gas plants at Port Campbell (including the Iona Underground Storage facility) to Melbourne.

During low Victorian demand periods, the SWP transports gas from Melbourne to Port Campbell to refill the Lochard Energy's Iona Underground Storage reservoirs and to flow to South Australia via the SEA Gas Pipeline. The stored gas is reinjected into the Victorian Transmission System (VTS) during the winter peak period to manage the supply and demand in the pipeline system.

Lochard Energy's Iona gas production and underground storage facilities have a standing injection capacity of 530TJ/d which is shared between two delivery points, that is, VTS and SEA Gas Pipeline. Currently, Iona injection into the VTS is constrained to 445 TJ/d[3] due to the capacity of the SWP. Once the Western Outer Ring Main (WORM) is completed in 2023, Iona will be able to inject up to 468 TJ/d into the VTS, which is still well short of their capacity of 530 TJ/d.

Lochard achieved Financial Investment Decision (FID) in December 2020 to commit to further increasing their injection capacity to 570 TJ/d and an increase of storage capacity to ~25 PJ by 1 January 2023.[4] Without expansion of the SWP, the additional gas available cannot be accessed, particularly during a shortfall of gas supplies in the VTS during winter peak periods.

Apart from Lochard, there are also two other production facilities which can deliver gas to the Victorian Declared Wholesale Gas Market (DWGM) which are;

- Origin Otway Gas Plant has a capacity of 82TJ/d and can deliver into the VTS via the SEA Gas injection point (no physical connection between the plant and SWP).
- Cooper Energy-Mitsui Group's Minerva Gas Plant, currently idle, is being developed to provide up to 16 PJ which can either be delivered directly to the SEA Gas pipeline or to the VTS via the SEA Gas injection point into the SWP.

2 "Issues Affecting Demand and Supply for Gas on the Victorian Transmission System", Sept 2021, Oakley Greenwood

3 The difference between Iona injection capacity and SWP capacity is approximately 20 TJ/d. Iona injection supplies west to the Western Transmission System (20 TJ/d in winter peak conditions) and east towards Melbourne. For example, for the expansion case where Iona injection capacity is increased to 570 TJ/d, the SWP capacity is 550 TJ/d.

4 Communications from Lochard Energy "20210803 Letter to APA on Iona expansion capacity".

These gas production facilities could also provide additional gas into to the SWP but without augmentation of the SWP, it will not be possible to access any additional gas from these sources.

Expanding the SWP will enable more gas to be accessed during the winter period from Iona, as shown in Figure 3 below, assuming APA's recommended expansion case (Option 2).

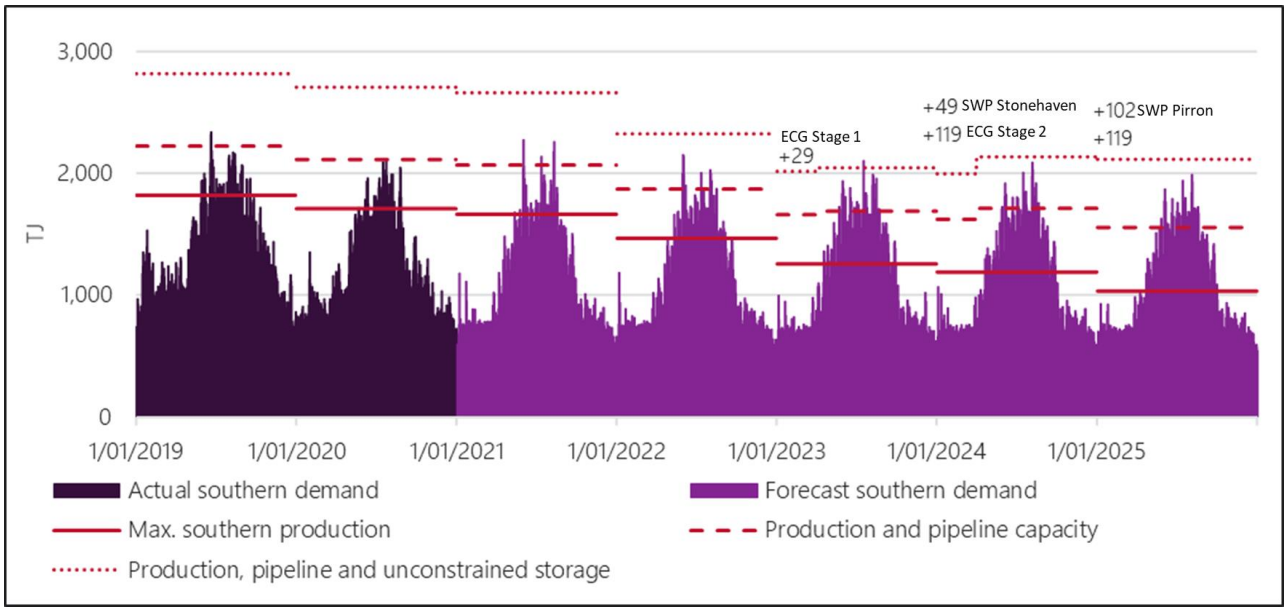


Figure 3: GSOO Supply-Demand Forecast adjusted with ECG and SWP Expansion (no PKGT)

4 Need for a supportive investment environment

The SWP expansion will require a supportive investment environment in order to proceed. As discussed throughout the Access Arrangement proposal, there is a strong tension between the needs for peak day security of supply and annual supply adequacy on one hand, against the ambitions of the Victorian government to reduce gas use through the Net Zero 2050 target Gas Substitution Road Map on the other.

The APA VTS access arrangement proposal includes three elements to create the supportive investment environment required to allow this project to proceed:

- If gas demand falls as envisioned by the Victorian Gas Substitution Road Map, the Infrastructure Victoria interim report and the AEMO IASR, the investment required to accommodate this project may only be required for a relatively short term – less than the long term nature of the required capital investment. There is a risk that gas may not play a sufficient role in the Victorian energy mix to enable APA VTS to recover its capital over the technical life of the assets required to be built. The APA VTS proposed access arrangement therefore proposes to limit depreciable asset lives to 30 years, and to review depreciable asset lives at each VTS access arrangement review going forward. This investment would be subject to the curtailed regulatory depreciation asset lives.

- If gas demand falls after these expansions are completed, the investment could be exposed to the National Gas Rules Capital Redundancy provisions in Rule 85. The APA VTS access arrangement proposal includes a Fixed Principle under Rule 99 that the capital redundancy provisions of Rule 85 or the Access Arrangement are never to apply to investment to expand the capacity of the VTS during the upcoming access arrangement period. This investment would be subject to that Fixed Principle.

For the avoidance of doubt, APA VTS sees investment in the SWP_570 expansion as being contingent on the AER's approval of a supportive investment environment as proposed in this AA proposal.

If these elements are not accepted by the AER in the APA VTS access arrangement, the resultant risk/reward imbalance will result in APA not proceeding with this project. APA VTS has been frank on this point with project proponents, the AER, AEMO, state and federal government agencies, and consumer representatives and industry participants through the stakeholder consultation process.

5 Risk Assessment

The National Gas Rules lists the following justifiable methods for Capital Expenditure[5];

i. to maintain and improve the safety of services; or

ii. to maintain the integrity of services; or

iii. to comply with a regulatory obligation or requirement; or

iv. to maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity).

As the Gas Industry Act and the Gas Safety Act (Part 2 (ESV), Section 9, "Objectives of ESV under this Act are (a) to ensure the safety of the conveyance, sale, supply, measurement, control and use of gas; …" and Part 3 (Gas Safety), Section 32 "General duties of gas companies. A gas company must manage and operate each of its facilities to minimise as far as practicable—…(c) the hazards and risks to the safety of the public and customers arising from— (i) interruptions to the conveyance or supply of gas; and (ii) the reinstatement of an interrupted gas supply.") imposes obligations on network operators and owners that relate to the continuity of gas supply, it is APA's belief that all points therefore justify Capital Expenditure required to ensure gas supply to customers at Corio and the Geelong network are maintained.

Construction. The project is of routine nature to APA VTS. The risk is mainly related to factors that are outside APA VTS control, particularly land heritage issues and delays due to weather conditions.

Technical. All construction work would be completed by technically proven contractors, to APA VTS's engineering design and specifications. All construction processes are overseen by APA VTS.

Operation. The facilities will be operated in accordance with APA VTS's standard management practices for assets of this type. APA VTS has a suitably qualified and experienced workforce in Victoria to perform this type of operation.

Regulatory. This investment should be regarded as complying with Rule 79(2)(c)(ii) and (iv), and therefore is conforming capital expenditure.

6 Options Considered

Several options were considered to increase the South West Pipeline injections into the VTS are as follows:

6.1 Option 1 – Do Nothing /No Capital Expenditure Option

APA does not submit any capital expenditure for expansion on the SWP. If PKGT is not constructed, there could be a threat to system security to the VTS with a shortfall of gas supplies from winter 2023.

AEMO will need to take short-term operational measures to reduce the threat, such as, controlled interruption/curtailment of demand during peak periods and management of GPG operations in the VTS.

[5] NGR 79 New capital expenditure criteria

To mitigate the risk of shortfall over time, there would be reliance on gas supplies from outside Victoria, such as, ECG expansion Stage 3 (including expansion of the Young to Culcairn Victorian Interconnect), PKGT or within Victoria with LNG Import terminals, that is, Viva Energy and Vopak (both around the Geelong area and have not reached FID).

The Do Nothing solution is not acceptable to VTS system security if the supply shortfall is significantly higher than predicted.

6.2 Option 2 – Compression on SWP

APA installed the Winchelsea compressor in 2017 which increased Iona's injection into the VTS to 445 TJ/d. After the completion of the WORM in 2023, the Iona will be able to inject up to 468 TJ/d. Augmentation would be required on the SWP to increase Iona injections to match Iona's 570 TJ/d capacity from 1 Jan 2023.

The SWP capacity is typically required during the winter peak period. Two options to augment the capacity would be install further compressors along the pipeline and/or loop the pipeline between Iona and Lara.

Three potential compression sites to increase SWP capacity are Stonehaven (KP118), Pirron (KP36.5-KP39 – Irrwillipe Area) and a second unit at the existing Winchelsea site (KP81). Refer to Appendix A for location of these sites. APA owns the land at Stonehaven and Winchelsea sites. The Winchelsea compressor site has already an allowance for a second unit to be installed. APA will need to purchase land at Pirron.

The Table 1 below details the increase in Iona injections for various compressed configurations.

Table 1: Capacity Increase with one additional unit on SWP

Configuration on the SWP	Compressor Location	Iona Injection Capability (TJ/d)	South West Pipeline Capacity[6] (TJ/d)	Commentary
Current (assuming WORM constructed)	Existing Winchelsea Taurus 60[7]	468	448	The capacity of 448 TJ/d quoted is after the Western Outer Ring Main is constructed and maximum pressure at Iona 9500 kPag.[8]
Single Additional Compressor	Stonehaven Taurus 60	517	497	Stonehaven provides the least capacity increase of the three locations, being the furthest downstream from Iona.
	2nd unit Winchelsea Taurus 60	533	513	Installing two units at Winchelsea will require re-staging of the existing Winchelsea. With two units running, the lower flow through existing unit will result in high recycling due to the staging configuration of the compressor. Re-staging the unit for a lower flow, high head performance would resolve the issue.
	Pirron Taurus 60	544	524	Compression at Pirron provides the highest capacity increase for the single compressor unit installation options.

[6] The difference between Iona injection capacity and SWP capacity is approximately 20 TJ/d. Iona injection supplies west to the Western Transmission System (20 TJ/d in winter peak conditions) and east towards Melbourne. For example, for the expansion case where Iona injection capacity is increased to 570 TJ/d, the SWP capacity is 550 TJ/d. All capacities are based on a 1 in 20 winter peak demand condition.

[7] Taurus 60 compressor from Solar Turbine which a power rating of 5.6 MW.

[8] The capacity of 445 TJ/d (pre-WORM project) and 468 TJ/d (post WORM project) are based on modelling in the AEMO Victorian Gas Planning Report (VGPR) March 2021 for an Iona injection maximum pressure of 9500 kPa. Since this publication, Iona injection pressure has been increased to 9700 kPa. All expansion capacities quoted in this business case are based on the 9700 kPa maximum Iona injection pressure.

From Table 1 above, installing an additional compressor station on the SWP will not achieve 570 TJ/d Iona injection capacity into the VTS. At least two new compressor stations will be required and/or looping of the SWP.

Table 2 below show the capacity developed with two new compressors installed on the SWP.

Table 2: Installation of 2 additional Compressors on SWP

Option	Augmentation	Iona Injection Capability (TJ/d)	SWP Capacity (TJ/d)	Capital Expenditure ($m)	Commentary
2	Stonehaven Taurus 60 Pirron Taurus 60 Piping works at Winchelsea compressor and aftercooler bypass valve. Upgrade of Brooklyn City Gate (BCG)	570	550	90.93	APA owns land at Stonehaven and will need to purchase land at Pirron. Works to reduce high pressure drops in Winchelsea station piping due to increased flows through the station. BCG upgrade due to maximum flows exceeded through facilities. Refer to Appendix C.

Compression at Pirron and Stonehaven meets the target capacity of 570 TJ/d Iona injections and is the preferred solution to augment the SWP. Refer to Appendix B for compressor configuration on the SWP.

APA will stage the two compressors, that is, Stonehaven by winter 2024 and Pirron by winter 2025. Installing a compressor within the VTS cannot be achieved before winter 2023 as the minimum lead time to install a compressor is 18 months. APA can only initiate the project after AER's approval in its Final Determination (November 2022). Otherwise, it will not be economically viable for APA to proceed with capital investment for this project.

As APA owns land at Stonehaven, this will be the faster of the two sites to install a compressor. For Stonehaven, the construction timetable would be around 17 months and could be completed by May 2023 if the project is initiated in early Dec 2022. Stonehaven CS will increase Iona injection capacity to 517 TJ/d (refer Table 1) which will mitigate the risk of shortfall by 49 TJ/d. Pirron provides a much higher capacity at 544 TJ/d but due to its longer lead time to secure land, may be delayed. The construction timetable for Pirron compressor station would be around 23 months. Therefore, the earliest which Pirron would be installed is in early 2025.

While re-filling of Iona underground storage is not a driver in this business case, the compressors will be installed to allow bi-directional functionality. With both compressors installed, westernhaul capacity will be increased from 200 TJ/d (with WORM) up to 329 TJ/d. Installation for bi-directional functionality would provide a higher withdrawal capacity for Iona, should it be required, at a small incremental cost to the project. This may allow Iona to cycle between filling and withdrawing over the winter season to provide a more seasonal, rather than just peak, storage service.

6.3 Option 3 – Compression and Looping

Table 3 below details the augmentation where a combination of compression and looping will provide up to 570 TJ/d of Iona injections in the VTS. Two options are:

- Option 3A is to install two compressors like that in Option 2 but at Stonehaven and Winchelsea. APA owns land at both these sites.
- Option 3B is to install a second unit at Winchelsea and lay looping upstream and downstream of the compressor station.

Refer to Appendix B for compressor and looping configuration.

Table 3: Option 3 Compression and Looping

Option	Augmentation	Iona Injection Capability (TJ/d)	SWP Capacity (TJ/d)	Capital Expenditure ($m)	Commentary
3A	Stonehaven T60 Winchelsea T60 2nd unit Lay 9 km x 20 inch of looping Re-staging of existing Winchelsea T60 unit, piping works and after cooler bypass. Upgrade of Brooklyn City Gate	570	550	107.68	Short length of looping upstream of Winchelsea required to achieve capacity of 570 TJ/d. Restaging of existing Winchelsea unit due to high recycling. Works to reduce pressure drops in station piping would be required. BCG upgrade due to maximum flows exceeded through facilities
3B	Winchelsea 2nd unit (Taurus 60) 37 km x 20 inch loop Re-staging of existing Winchelsea T60 unit, piping works and after cooler bypass. Upgrade of Brooklyn City Gate	570	550	139.0	Existing Winchelsea station has land allowance for a second unit. Looping upstream (32 km) and downstream (5 km) of Winchelsea compressor station. Without looping, a second unit at Winchelsea will provide 534 TJ/d of capacity only. Restaging of existing Winchelsea unit required due to high recycling. Works to reduce pressure drops in station piping would be required. BCG upgrade due to maximum flows exceeded through facility.

The higher capital expenditure associated with the looping, resulted in both option 3A and 3B to be less cost effective than Option 2. For Option 3B, the 37 km looping will require 18 months for lands approval and constructed by 2025. The high capital cost does not make this option viable.

Option 3A is unable to achieve 570 TJ/d with Stonehaven and a 2nd unit at Winchelsea without 9 km amount of looping. Without the looping, 558 TJ/d of Iona injection could be achieved. Like Option 2, the compressors may be staged with installation at Winchelsea and/or Stonehaven completed first and then looping later. Stonehaven could be constructed in 17 months, that is, completed by May 2024. However, Winchelsea will require additional works such of re-staging and may take longer. The 9km looping will require 13 months for lands approval prior to construction and will be completed after winter 2024.

Option 3A is the second preferred option after Option 2 if APA is unable to secure land at Pirron.

6.4 Option 4 – Looping only

Option 4 details a looping only option whereby looping upstream and downstream of the existing Winchelsea is required to achieve 570 TJ/d Iona injection capacity. Refer to Appendix B for looping configuration.

Table 4: Looping Option

Option	Looping	Iona injection capability (TJ/d)	Capital Expenditure ($m)	Commentary
4	65 km x 20 inch looping Winchelsea piping works and aftercooler bypass. Upgrade of Brooklyn City Gate	570	173.52	Looping upstream and downstream of Winchelsea compressor station.

Option 4 is the least cost-effective option, hence not a viable one. Furthermore, the 65 km of looping could take up to 36 months for land approvals and would only be completed in early 2027.

However, based on a longer-term focus, looping would be a preferable option if hydrogen is introduced into the VTS. APA's decarbonization strategy incorporates hydrogen (H2) initiatives and will be conducting studies on the viability of the transporting up to 10% H2 blend in the transmission pipelines of the VTS. With renewable energy zones around the Western Transmission System and opportunities for H2 production in industrial areas like Geelong, looping installed on the SWP could later be used to transport H2. Note that Iona may be unable to accept H2 gas into its Underground storage, therefore for any new H2 opportunity in the south west region of the VTS, laying a new pipeline may be prudent. Hence for Option 4, the pipeline would be laid for H2 readiness and later decoupled from the SWP to transport H2 or H2/natural gas blends to/from Geelong and WTS. However, at this stage, there are no committed opportunities to support this option.

6.5 Summary of Cost/Benefit Analysis

The cost/benefits of the SWP Expansion Project are outlined in the table below.

TABLE 5.3: SUMMARY OF COST/BENEFIT ANALYSIS

Option	Benefits (Risk Reduction)	Costs
Option 1 Do Nothing Option	• No capital expenditure required. • Curtailment or capital expenditure outside the VTS to mitigate supply shortfall.	• Capex: $0 m • Risk of shortfall during winter peak demand from 2023.
Option 2: **Recommended Option** Stonehaven and Pirron T60 compressor installation Winchelsea piping works BCG Upgrade	• Ability to stage compression, proposal is to install Stonehaven T60 first as APA owns land there. Stonehaven would provide an incremental 49 TJ/d toward mitigation of shortfall.	• Capex: $90.93 m • Risk of shortfall during winter peak demand from 2023. Project (Stonehaven first stage) can only be delivered earliest by winter 2024. • Risk of redundant assets over time as VTS demand reduces with decarbonization initiatives.
Option 3A: Stonehaven and Winchelsea 2nd unit T60 installation Winchelsea re-staging BCG Upgrade 9 km loop	• Both compressor stations are on land which APA owns. • Small amount of looping required to achieve 570 TJ/d. Looping may be staged. • This option is the second preference after Option 2.	• Capex $107.68 m • Looping increases the cost of installing the solution. • Risk of supply shortfall in winter 2023. Project (Stonehaven first stage) can only be delivered earliest by winter 2024. • Risk of redundant assets in the future.

Option 3B: Winchelsea 2nd unit T60 installation Winchelsea re-staging BCG Upgrade 37 km loop	• APA has land allowed for 2nd unit at Winchelsea.	• Capex $139.0 m • Looping increases cost and time to install solution. Project completion before winter 2025, hence risk of supply shortfall in winter 2023 and 2024. • Risk of redundant assets in the future.
Option 4 65 km Looping only Winchelsea piping works BCG Upgrade	• Prudent if it was installed for a longer-term solution. • Loops laid to hydrogen readiness and may be eventually decoupled from SWP as a dedicated H2 backbone to cater for H2 opportunities in the region i.e .Geelong, South West renewable zones.	• Capex $173.52 m • Most expensive capital expenditure • Longer time to install due to land/easement approval. Project can only be completed in early 2027.

7 Consistency with the National Gas Rules

The requirements for justification of conforming capital expenditure specified in Rule 79(2) are as follows:

The capital expenditure must be justifiable on one of the following grounds;

a. The overall economic value of the expenditure is positive, or

b. The present value of the expected incremental revenue to be generated as a result of the expenditure exceeds the present value of the capital expenditure, or

c. The capital expenditure is necessary;

i. To maintain and improve the safety of services, or

ii. To maintain integrity of services, or

iii. To comply with regulatory obligation or requirement, or

iv. To maintain the service provider's capacity to meet levels of demand for services existing at the time the capital expenditure is incurred (as distinct from projected demand that is dependent on an expansion of pipeline capacity); or

d. The capital expenditure is an aggregate amount divisible into two parts, one referable to incremental services and the other referable to a purpose referred to in paragraph "c", and the former is justifiable under paragraph "b" and the latter under paragraph "c".

APA considers that the above presented capital project meets the criteria of Rule 79(2)(c)(ii) and (iv), that is the project capital expenditure is necessary to maintain integrity of services, and to maintain the capacity to meet existing levels of demand for services, hence the capital expenditure is justified under Rule 79(2)(c)(ii) and (iv), as conforming for the purpose of its inclusion into the capital base of the APA VTS System.

8 Cost Breakdown

The capital and operating costs for the Project (Option2) are detailed in the Table below in 2021 dollars.

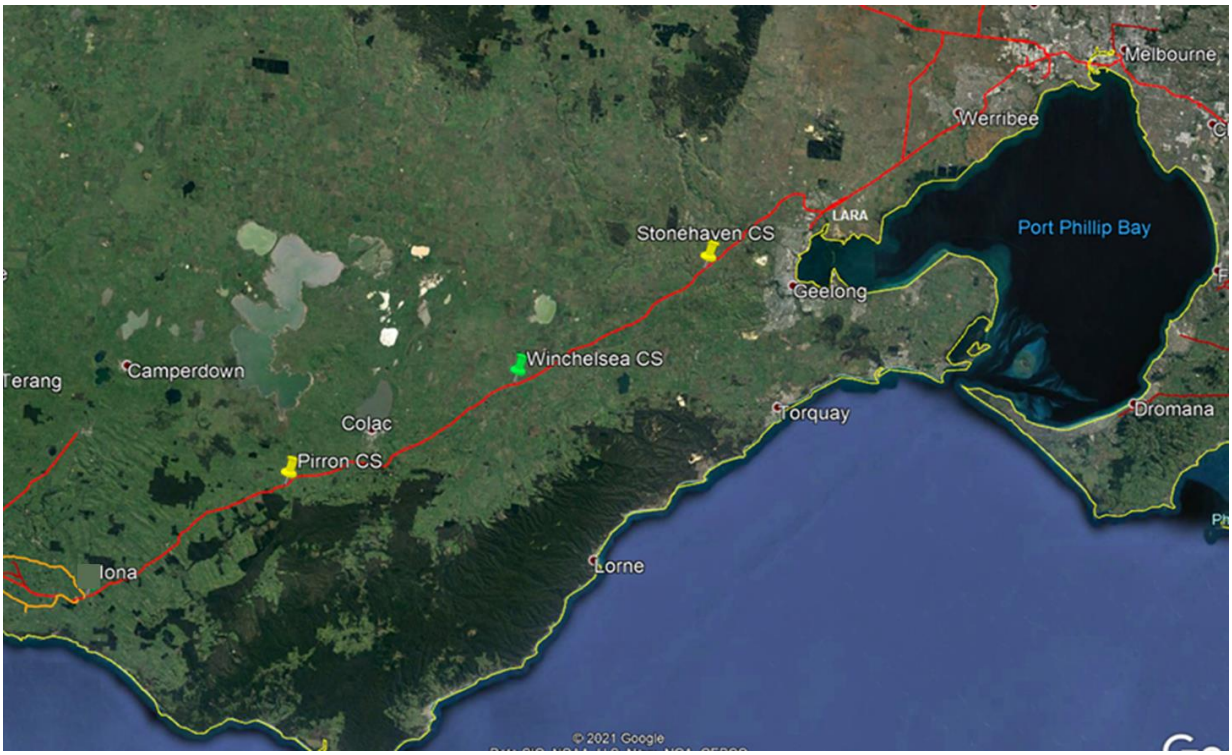
TABLE 5.5: PROJECT COST ESTIMATE, BY COST

Pirron & Stonehaven Compressors	2023	2024	2025	2026	2027	Total
Project Management	1.99 m	2.53 m	0.43 m			**4.95 m**
Land & Approvals	2.34 m	0.63 m				**2.97 m**
Design	9.19 m					**9.19 m**
Procurement	20.95 m	14.60m				**35.55 m**
Construction		25.10 m	3.26 m			**28.36 m**
Commissioning & Handover		3.13 m	3.13 m			**6.26 m**
Total	**34.47 m**	**45.99 m**	**6.82 m**			**87.28 m**

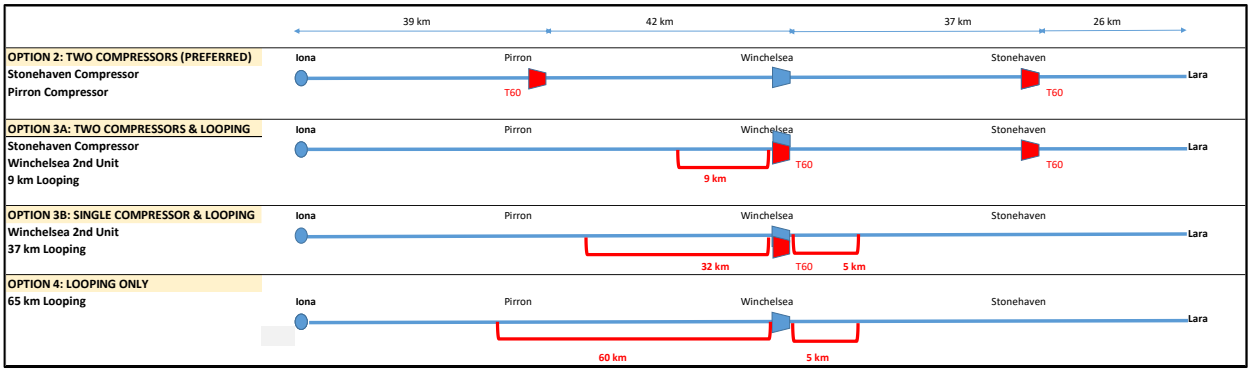
Brooklyn CG and Winchelsea Upgrades	2023	2024	2025	2026	2027	Total
Project Management		0.01 m				**0.01 m**
Land & Approvals						
Design		1.52 m				**1.52 m**
Procurement		1.01 m				**1.01 m**
Construction		0.99 m				**0.99 m**
Commissioning & Handover		0.11 m				**0.11 m**
Total		**3.64 m**				**3.64 m**

Total Option 2	2023	2024	2025	2026	2027	Total
Project Management	1.99 m	2.54 m	0.43 m			**4.96 m**
Land & Approvals	2.34 m	0.63 m				**2.97 m**
Design	9.19 m	1.52 m				**10.71 m**
Procurement	20.95 m	15.62 m				**36.56 m**
Construction		26.09 m	3.26 m			**29.35 m**
Commissioning & Handover		3.24 m	3.13 m			**6.37 m**
Total	**34.47 m**	**49.64 m**	**6.82 m**			**90.93 m**

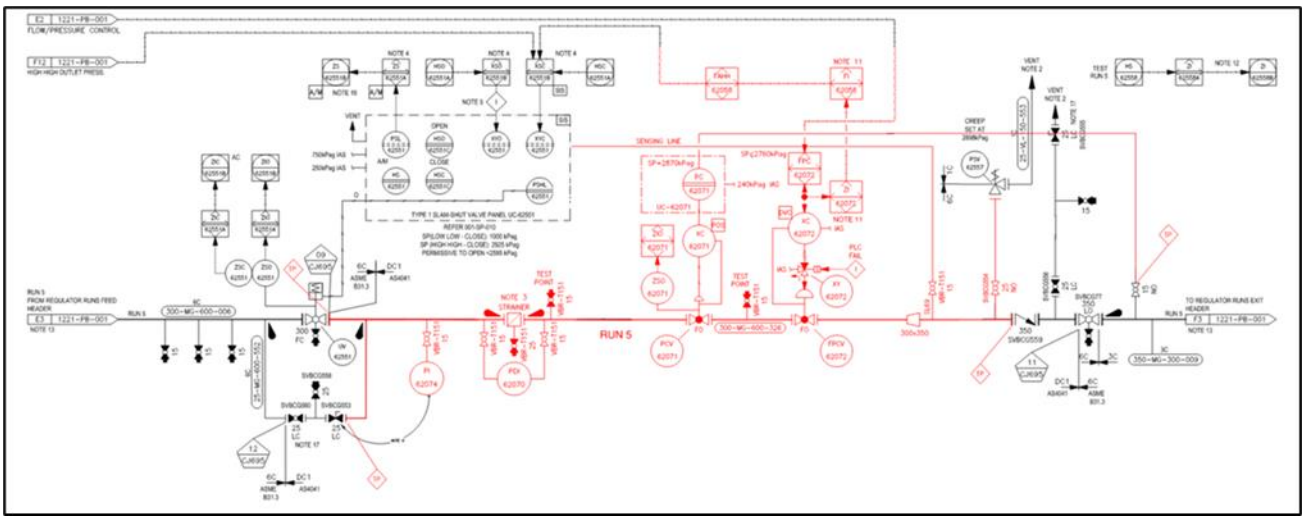
8.1 Appendix A. Location of compressors sites on the South West Pipeline



8.2 Appendix B: Configuration of SWP Expansion Options



8.3 Appendix C. Brooklyn City Gate Upgrade



Upgrade of BCG requires an upsize of Run 5, station flowmeter and strainer replacement (runs 1-5).