August 2016

roma to brisbane pipeline

access arrangement submission.

attachment 4-1 – Asset Management Plan

PLAN

ASSET MANAGEMENT

RBP AMP FY17 – FY21

Document No					
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Executive Summary

The Asset Management Plan ("AMP") is a tactical document which covers the planning period from 1 July 2017 to 30 June 2021. The AMP also details the current financial year project information in addition to providing a summary of the previous financial year project performance. It is updated, approved and reissued on an annual basis.

The AMP identifies the necessary actions required to optimally manage the APA owned and operated QLD Transmission assets over a five-year period. A long-term consideration of the integrity of assets is necessary to ensure that they remain fit-for-purpose and to allow for longer term key strategic planning activities.

APA's asset management policy ensures that assets are maintained to preserve operability and enhance the useful life of the asset. Replacement or upgrade is primarily based on condition assessment with an understanding of the assets predefined life cycle. Changed functional demands may also necessitate asset upgrade or replacement. Importantly, assets are also operated and maintained in compliance to respective governing Australian Standards.

The Roma Brisbane Pipeline is defined as a strategic pipeline in accordance with the Queensland Petroleum and Gas (Prodcution and Safety) Act 2004, which forms part of the larger East Coast Grid.

A number of changes in RBP assets and associated demands through 2015 are taken into account in this AMP. Highlights are:

- Change in gas contracts on the RBP (Swanbank Power Station and BP at Gibson Island shut downs and new Oakey Power contract), with resulting spare capacity for east bound flows to Brisbane;
- Reverse flow occuring in the DN400 from midline receipt points to Wallumbilla, so that the pipeline can flow gas in a western direction to Wallumbilla, to ultimately supply the developing Liquified Natural Gas (LNG) market;

The RBP has an assured future however it is an ageing asset at 47 years old and it has entered a period of asset replacement and upgrades. The RBP DN250 mainline suffers extensively from the failure of its protective outer coating which has led to significant metal loss features from active corrosion and presence of Stress Corrosions Cracking (SCC), in addition to a significant increase in the demands of the cathodic protection (CP) system. Both SCC and corrosion defects are actively managed by ongoing integrity inspection and reinstatement programs, including CP upgrades, which demand significant capital funding to maintain the current levels of integrity assurance over the remaining life of the pipeline.

The following table presents a summary of the proposed Stay In Business (SIB) Capital expenditure profile over this planning period for the RBP. Further detail appears in Section 7.4 and also Appendix 1 which details individual items requiring either SIB or MEJ funding provisions. It is also anticipated that there will be no significant change in our baseline opex BAU costs moving forward.

Table 1 - Five Year CAPEX Expense Summary

ID		Fy17	Fy18	Fy19	Fy20	Fy21
1	Pipeline	14,514,000	21,780,000	14,168,000	5,833,000	7,258,,000
2	Stations	895,000	1,295,000	615,000	305,000	150,000
4	QLD Operations / Facility	210,000	200,000	200,000	200,000	200,000
5	**Grand Total**	**15,619,000**	**23,275,000**	**14,983,000**	**6,338,000**	**7,608,000**

Commentary

1. The major expenses (>$1M) in the above 5 year SIB Capex breakdown are highlighted below (and further defined in this AMP):
    a. RBP Risk Mitigation Works ($10,850M), with bulk expenditure budgeted for FY17 and minor carryover continuing;
    b. Annual RBP Integrity Upgrade Program (ranging $4 – 5.5 M per year), features as prioritised per year;
    c. RBP DN250 crack detection tool (EMAT) budgeted across two financial years FY18 and FY19 (subject to tool availability);
    d. deleted (CONFIDENTIAL);
    e. RBP DN250 high-resolution MFL, geometry and XYZ internal mapping intelligent pig inspection program ($1.5M) in FY19;
    f. RBP DN400 high-resolution MFL, geometry and XYZ internal mapping intelligent pig inspection program ($1.8M) in FY21;
2. The above CAPEX budget includes all priority classified items (High, Medium and Low).
3. The CAPEX budget does not consider capital purchase in relation to vehicles and plant on the basis that RBP vehicles are continuing to be leased and existing plant is sufficient for the next 5 year period; tools necessary for the work program delivery are included.

The following table presents a summary of the proposed Operational Expenditure (OPEX) profile over this planning period.

Table 1 Five Year OPEX Summary

ID	RBP	Fy17 Budget	Fy18 F/cast	Fy19 F/cast	Fy20 F/cas7	Fy21 F/cast
1	Base BAU [O&M]	$8,000,000	$8,000,000	$8,000,000	$8,000,000	$8,000,000
2	MEJ		$150,000	$230,000	$50,000	

Commentary

- Forecast figures do not include CPI escallation rates and are based on continuation of Operations and Maintenance historic costs.

- Major cost items are for internal labour (approx. 60%) and contractors (approx. 15%)

1. Introduction

1.1 Purpose and Scope

The Asset Management Plan ("AMP") covers the planning period from 1 July 2017 to 30 June 2021 and is updated and reissued on an annual basis. The AMP also details the current financial year project information in addition to providing a summary of the previous financial year project performance.

The AMP identifies the necessary actions required to optimally manage the RBP. A long-term consideration of the integrity of assets is necessary to ensure that they remain fit-for-purpose.

The purpose meets the overall asset management objective of providing the process to ensure that APA assets are maintained to an acceptable level of risk throughout their life cycle whilst providing the necessary supply capability for the required duty.

The AMP is diligently prepared on the basis of the best known information at the time of writing.

The purpose of the AMP is:

- To provide a comprehensive understanding of the current management approach relating to the assets, their condition and their utilisation;
- To identify strategic recommendations for future utilisation;
- To provide a platform for approval of work programs by providing discussion of the options available and recommendations; and
- To identify specific issues affecting the assets and the proposed remediation for budget consideration.

1.2 Pipeline Management System

AS2885.3 requires that the Licensee have in place a documented and approved Pipeline Management System (PMS) and that the content and approach of the PMS is compliant to what is required by the Standard.

APA has implemented an approved PMS which provides guidance to the organisation regarding high pressure pipeline management and operation techniques. It provides the framework for a consistent and appropriate process throughout the business for all pipelines operating under AS2885.

State-based regulatory requirements are managed via companion documents that describe the PMS and set out any additional requirements as required by the state regulations. In QLD, this is set out through the Pipeline Management Plan – Chapters 1 and 3.

The PMS also defines the policies and procedures around the annual asset management process to which this AMP is developed.

1.3 Goverance

The AMP is reviewed and approved each financial year to ensure that the content is current.

Changes to the assets will inevitably occur during the life of the AMP. Unless there are issues identified that significantly impact the validity of the Plan it is only intended to amend the AMP at each annual review.

1.4 Exclusions

The Kogan North Gas Processing Facility is excluded from this AMP as it is an EII asset, however the connection into the RBP is included as defined in the asset description.

1.5 Terms & Abbreviations

The Generic APA Terms and Abbreviations are listed in the Terms and Abbreviations Glossary.

The Specific Terms and Abbreviations used in this document are listed below:

Table 2 Terms and Abbreviations

Item	Definition
AMP	Asset Management Plan
PMS	Pipeline Management System
CP	Cathodic Protection
RBP	Roma Brisbane Pipeline
MEJ	Major Expense Job
PRA	Plant Release Authority

1.6 References

All work performed in accordance with this plan shall be in conformance with the current issue, including amendments, of those national and international standards, codes of practice, guidelines and APA documents listed in Table 3.

Table 3 Referenced Documents

Referenced Document	
APA Standards	
320-POL-AM-0018	Pipeline Management System
320-PL-AM-0027	QLD Pipeline Integrity Management Plan

Referenced Document	
320-PL-HEL-001	Lands Management Plan
320-PL-AM-004	Pipeline Management Plan – Chapters 1 and 3
Australian Standards	
AS 2885	Pipelines – Gas and Liquid Petroleum
International Standards	

2. Asset Objectives

The following objectives are nationally based and reflect the vision and direction of the organisation.

2.1 Fitness For Purpose

Legislation and the Pipeline Management Policy require our assets to be operated and maintained in a fit for purpose condition and protected from any foreseeable threat of failure. In this regard failure can be regarded as a loss of containment or an action occuring that could have resulted in a loss of containment. It is also a requirement to maintain the pipeline assets in fit for service condition with respect to the supply and delivery of customer nominated amounts of energy.

To achieve these requirements the pipeline asset management framework (defined in the PMS) defines the management practices and processes that shall be utilised to manage the lifecycle of the assets. The processes are designed to maintain the asset condition to satisfy, wherever possible, the conditions detailed in the original design basis for the assets.

2.2 Compliance

Pipelines are required to be compliant with State Regulation and Australian Standards. Where regulation or Australian Standards don't exist, Pipeline Acts and International Standards are typically adopted.

APA requires all pipelines to be operated and managed in accordance with the requirements and in accordance with their original Design Basis where applicable.

All operational groups will be audited for compliance to these requirements.

2.3 Risk Management

APA Group has established an enterprise wide risk management strategy and framework (refer to the Risk Management Policy). The Board is ultimately responsible for determining the risk appetite of APA Group and approving and reviewing the risk management policies of the company. The Board has established a separate Audit and Risk Management Committee with specific responsibility to provide assistance to the Board in fulfilling its corporate governance and oversight responsibilities.

AS2885 specifies pipeline specific risk management techniques, safety management studies, which are used throughout the life of the assets. These are non-negotiable and all pipeline operating groups will manage risk on their assets in direct accordance with this Standard.

One of the significant risk that requires significant risk management is the potential of third party damage to APA's pipelines as a direct result of the continuing urban encroachment largely due to the expansion of and developement of new housing and industrial estates adjacent to the pipeline corridoors.

3. System Overview

3.1 Asset Information

APA Queensland's gas infrastructure is shown in Figure below.

The Queensland pipeline infrastructure is physically linked to the southern pipelines, that is, the Moomba Sydney Pipeline and Victorian Transmission System. This interconnected infrastructure is known as the East Coast Grid.

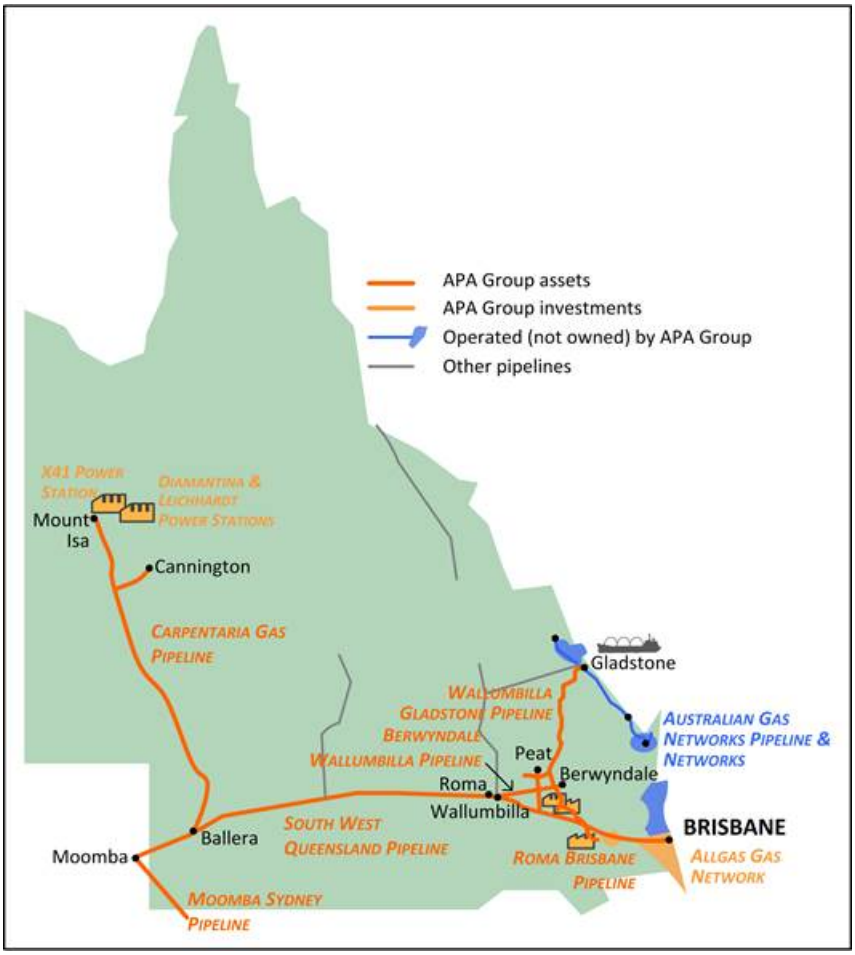


Figure 1 – Schematic APA Queensland Gas Infrastructure

The Licensed pipelines that form the scope of this AMP are summarised below. For more details regarding the asset description, refer to the QLD Pipeline Management Plan Chapter 3 Appendices.

3.1.1 Roma Brisbane Pipeline (RBP) System

The Roma to Brisbane Pipeline (PL 2) consists of:

- DN250 RBP - Wallumbilla to Bellbird Park approximately 396.8 km in length which was commissioned in 1969;

- DN300 RBP Metro – Bellbird Park to Gibson Island. This section is approximately 40.2 km in length and consists of 37.6 km of DN300 and 2.6 km of DN200 which was commissioned in 1969;
- DN400 RBP - Wallumbilla to Swanbank Power Station approximately 405.55 km in length which was constructed and commissioned in stages between 1988 and 2002.
- DN400 Collingwood-Ellengrove Pipeline – a lateral running from Collingwood Drive Inlet Station on the DN400 pipeline to Ellengrove Gate Station which is approximately 9.5 km in length, commissioned in 2002.
- DN200 Lytton Lateral, a 5.4 km extension from the end of the DN300 at the SEA Block Valve to the Lytton Meter Station, which was commissioned in 2010;
- DN400 Metro Looping 1 - a section of 5.815 km of Brisbane metro looping pipeline from Carina to Paringa Road Scraper Station which was commissioned in 2012;

The original RBP DN250, DN300 and DN200 lines which were commissioned in 1969 are considered to be aging pipelines with specific integrity issues requiring ongoing management.

The RBP is the only supply of natural gas to south-east Queensland distribution networks, including the Brisbane metropolitan area, Gold Coast and northern New South Wales.

3.1.2 Peat Lateral Pipeline

This AMP also includes the Peat Lateral Pipeline (PL 74), which consists of:

- The Woodroyd to RBP DN250 pipeline 110.7 km long (commissioned 2001); and
- The Scotia Extension DN250 pipeline 10.7 km long (commissioned in 2002).

The Peat Lateral connects the Scotia and Peat (Woodroyd) coal seam gas production facilities into the RBP at Arubial inlet station, near Condamine.

3.1.3 Stations

The major stations that support the operation of the RBP System are:

3.1.3.1 Compressor Stations

Gas compression equipment that is currently installed on the RBP system is detailed in Table 4 Gas Compression Equipment below, the compression equipment is of either gas turbine driven or reciprocating engine driven.

Table 4 Gas Compression Equipment

Roma Brisbane Pipeline	
Gatton	*Solar T1602 S20 –C160 wet seal compressor (DN400) – Decommissioned*
Dalby	Solar T1602 S20 –C160 wet seal compressor (Decommissioned) & Centaur C50 (DN400)
Condamine	*Solar T1602 S20 –C160 wet seal compressor (DN400) – Decommissioned*
Oakey	Solar T1602 S20 –C168 wet seal compressor (DN250)

Roma Brisbane Pipeline	
Kogan	Solar T1602 S20 –C168 wet seal compressor (DN250)
Yuleba	*Solar T1602 S20 –C168 wet seal compressor (DN250) – Decommissioned*

3.1.3.2 Receipt Stations

Gas is receipted into the RBP system at the following key stations:

- At Wallumbilla Meter Station, which can inject gas from various producers and interconnected pipelines at the Wallumbilla Hub.
- At Scotia (Santos) and Woodroyd (Origin) into the Peat Lateral;
- At Condamine via the bidirectional interconnect to the Braema pipeline (Alinta)
- At Windibri and Argyle receipt facilities (QGC);
- At the Kogan North receipt facility (plant is operated by APA but excluded from this AMP)

3.1.3.3 Delivery Stations

Gas is delivered from the RBP at numerous meter stations; the main stations are:

- Wallumbilla Meter Station (RBP and SWQP) when flowing westbound from RBP to SWQP. Metering is undertaken in the SWQP facility.
- Condamine Braema interconnect, when in delivery mode
- Oakey Power Station
- Gibson Island Meter Station off RBP
- Swanbank Meter Station off RBP
- Numerous distribution network offtake / gate stations in Dalby, Toowoomba, Ipswich and Brisbane

3.1.3.4 Odorant Stations

Gas in the RBP system is generally unodourised. The RBP system includes one odourant facility at Lytton Meter Station. Distribution network offtakes from the RBP (operated by others) include odourant systems as required.

3.1.4 Facilities

APA's main operation and maintenance facilities for the RBP include:

- Wallumbilla workshop, stores and office facility. Operational maintenance personnel are located at this facility who maintain the RBP Wallumbilla Meter Station.
- Dalby workshop, stores and office facility. Dably is the main operations base for the central and western RBP.
- Bellbird Park (Brisbane outskirts) workshop and stores.
- Brisbane (Spring Hill) – main office for operations management, engineering, control room and other office based staff.

Other sites along the RBP, particularly the existing and former compressor stations, have various local control facilities, storage sheds and workshops and are utilised as required.

3.2 Demand Management

3.2.1 RBP Transportation Demand

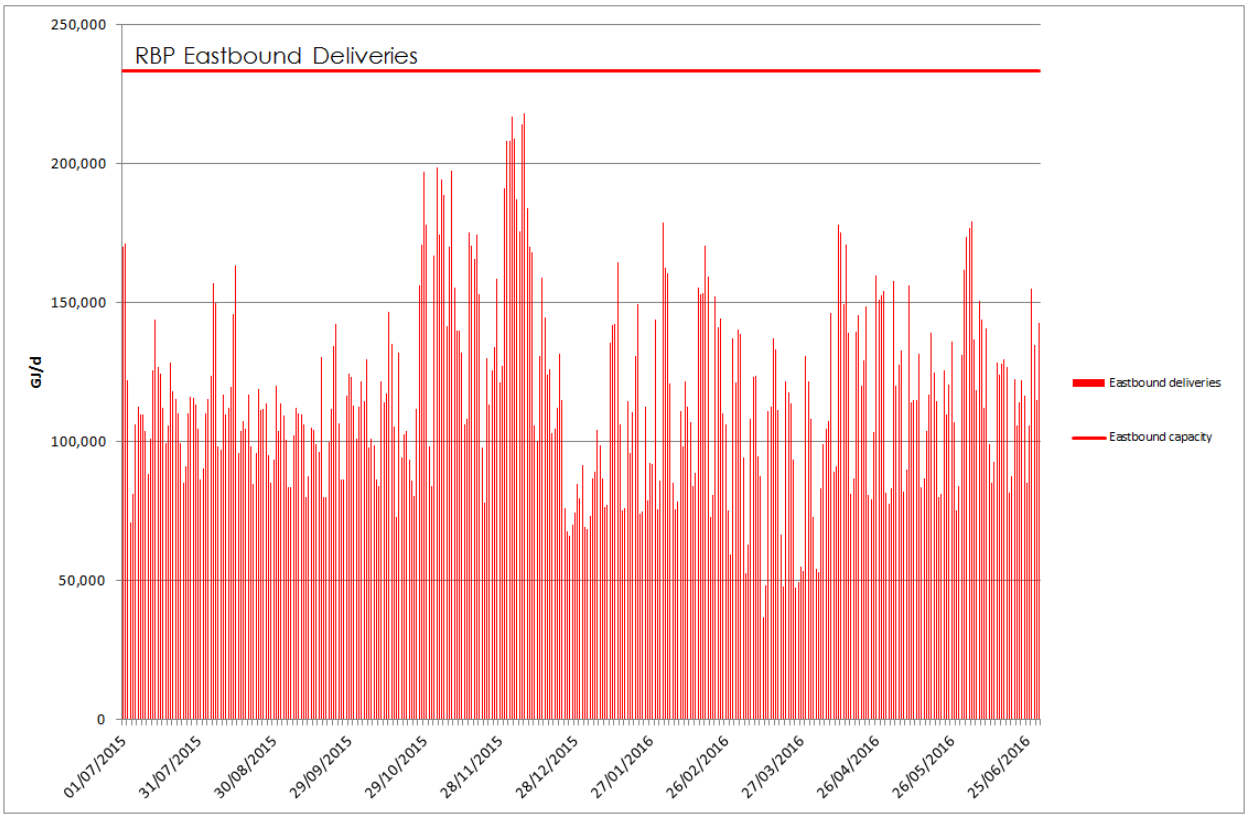
The table below shows the capacity development of the RBP to increase pipeline capacity for new contracts.

Year	Augmentation/Changes in Configuration	Capacity
1981 - 1986	Installation of 6 compressor stations on DN250 pipeline.	60 TJ/d
1988 - 2002	Staged DN400 looping to supply Swanbank Power Station at Ipswich	208 TJ/d
2002	Pressure upgrade from Bellbird Park to Mt Gravatt Block valve from 4,200kPa to 4,612kPa to meet pressure minimum requirements at Murarrie	-
2002	Construction of the Peat Lateral to bring coal seam gas from Woodroyd to Scotia	40 TJ/d (for Peat Lateral)
2011	Increasing midline receipts volumes from Windibri and Argyle, resulting in an increase in pipeline capacity.	219 TJ/d
2012 (August)	MOP Upgrade of the DN400 from 8000 kPa to 9300/9600 kPa from Wallumbilla to Ellengrove. Installation of the Centaur 50 compressor (unit 2) at Dalby Looping of 5.8 km x DN400 in the metro section between Prestons Road and Murrarie Upgrade of capacity of the Ellengrove regulating station. Mothball of Condamine, Dalby and Gatton Saturn 20 compressors.	233 TJ/d
2013	RBP pipeline changes to pressure control on Run 3 to retain capacity as midline receipts volumes were anticipated to be reduced and all gas to come from Wallumbilla (never eventuated).	233 TJ/d
Mid 2015	With the Shutdown of Swanbank Power Station and BP at Gibson Island, a decision was made to decommission Dalby, Gatton, Condamine and Yuleba Saturn 20 units, hence leaving the RBP with 3 operating compressor station that is Dalby C50 on	233 TJ/d

	the DN400 pipeline, and Kogan and Oakey S20s on the DN250 pipeline.	
Sept 2015	RBP Reverse Flow. Gas from midline receipts points to Wallumbilla on DN400.	120 TJ/d (reverse flow)
Future Outlook (1-2 years)	With the shutdown of Swanbank Power Station and BP at Gibson Island, there is significant amount of spare capacity on the RBP. Risk reduction planning is currently being conducted on Brisbane metro which runs through sensitive urban areas. This ultimately will result in a reduced MOP of this section.	207 TJ/d (u/s Ellengrove) 110TJ/d (d/s Ellengove)

Historical demand is shown below for 2014-15 which represent:

- Reduced demand on the RBP due to shutdown of Swanbank Power Station and BP at Gibson Island
- New firm contract at Oakey Power Station.



3.2.2 RBP Compressor Operating Philosophy

The RBP Compressor Operating Philosophy (320-POL-AM-0023) was updated in 2015 to reflect the pipeline throughput and contractual MDQ's current as of November 2015 and corresponding operating strategy and maintenance philosophy. While the pipeline throughput varies (and has been reduced due to Swanbank offline and BP ramp down of flows), the contractual requirements has identified the need to maintain the current RBP capacity, and hence compressors at Oakey, Kogan and Dalby to meet maximum contracted values. The philosophy document shows that compression on the RBP (generally by Dalby Unit 2) is required when Oakey takes firm and interruptible service for more than two days consecutively (and there are other scenarios on occasion that also require various combinations of compression).

Further to this, it has also been identified that compressor usage is likely to increase on the DN250 pipeline (Kogan and Oakey compressors) with the upcoming RBP Risk Mitigation works (ie RBP metro MOP restriction) being implemented, in order to maintain contractual flow rates at the minimum pressure.

The current classifications of the operating compressors on the RBP are:

- Kogan: Standby
- Dalby U2: Intermittent
- Oakey: Standby

3.2.3 Maintenance & Operating Constraints

Operating constrains are currently imposed on the RBP. These constraints are MOP restrictions which are selectively imposed for the repair of specific ILI features as may be determined by the Integrity Engineer.

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There are no other operating constraints on the other pipeline assets nor stations other than specified design limits and gas contract agreements.

3.2.4 Supply Integrity Risks and Mitigations

Maintenance is planned in advance to ensure that the integrity of supply is secured and that the compressors have high availability. Typically maintenance is not conducted on gas compressors or other assets that will adversely affect gas deliveries and such maintenance timing is determined in conjunction with the Commercial Group.

Significant supply impacts will be in place in FY17 on the RBP for both the metro MFL ILI program (reduction of gas flow to accommodate ILI) and the integrity upgrade excavations (temporary MOP restrictions for excavation, as required). Otherwise the delivery of capex and opex works are undertaken in accordance with APA PRA notification policy to ensure minimal impact on shippers.

Unplanned maintenance is dealt with on a case by case scenario and depending on the nature of the maintenance is planned or acted on urgently.

3.3 Compliance

3.3.1 Licence Register & Renewal

APA maintains a QLD compliance schedule and reporting register to monitor license renewals. This register shows that no licenses require renewal for this AMP's 5 year term.

3.3.2 Reporting Register

Regulatory compliance reports are prepared and submitted in strict accordance with the requirements of the applicable governing State Legislation.

The annual regulatory reporting timetable for the RBP is:

- Queensland: 31st August for all pipelines with a QLD Licence.

The reporting register is managed as part of the compliance process within APA's management systems. Below is an extract of upcoming asset review compliance reports for the RBP system due in 2016/2017.

SMS and Location Class Review	Asset	Due date
PPL 74	Peat	Nov 2016
Remaining Life Review	**Asset**	**Due date[1]**
PPL 2	RBP	Jun 2016
PPL 74	Peat	Jun 2016

As per the above, an SMS review workshop for the Peat Lateral will be required in FY17, with a requirement to be completed prior to the end of 2016. The completion of the RBP Remaining Life Review is on target, with the metro component completed. These works are undertaken inhouse and are allocated for funding out of the operational BAU budget for each asset.

SMSs and RLRs conducted in the last financial year (2015-16) were:

- Remaining Life Review: RBP PPL 2 – metro only;
- Safety Management Study – full RBP PPL 2;

Any impacts from these studies on the asset management plan are discussed under Section4 Asset Risks.

[1] While the target frequencies in AS2885 are 10 yearly, the assets selected for RLR are due to alternate review triggers (ie taking into account time since last MAOP review since the code changed and recent emergency works on the RBP).

3.3.3 Regulatory Changes

Changes in legislation is monitored and managed through subscription to LAWLEX for Gas Newsfeed, Occupational Health & Safety Newsfeed and Environmental Newsfeed. Any changes to Australian and International Standards is monitored through a subscription to Standards Watch to ensure these are identified quickly and changes put into place where required.

There were no material changes to the acts, legislation and licences during the prior year.

3.3.4 Equipment Compliance

Equipment regulatory compliance is undertaken by achieving compliance to the following Australian Standards:

- Pressure vessels are maintained and tested in accordance with AS 3788
- Pressure safety valves are maintained and tested in accordance with AS 3788
- Hazardous Area electrical equipment is maintained in accordance with AS 6079 series
- Electrical safety mitigation equipment installed on a pipeline is maintained in accordance with AS 4853
- Cathodic Protection systems are operated maintained in accordance with AS2832.
- Type B gas appliances are designed to ensure compliance with AS3814 (as required by the QLD Petroleum & Natural Gas Act and Regulation).

Capex work programs are in place on the RBP system to maintain ongoing compliance requirements specifically for Pressure Vessels, Hazardous Area, Cathodic Protection (incl interference mitigation) and Type B Compliance. These programs are to ensure adequate funding is set aside annually to bring the asset up to full compliance.

Significant expenditure has been in place over the recent financial year SIB programs to maintain hazardous area compliance, including inspections and development or update of hazardous area dossiers where applicable. The focus in rectification has been on replacement of components for fire and gas and aftercooler equipment. Remaining works to bring RBP sites to compliance (particularly at Oakey and Kogan stations) are for:

- Valve skid instrumentation and cabling replacement
- Fuel gas skid instrumentation and cabling replacement
- Aftercooler fan motor replacement
- Compressor shed lights replacement.

While funding will be made available to complete these programs, it is anticipated that the amount required will be less than previous years to complete the compliance program into FY18. Any minor replacements as a result of the continual inspections will then be captured operationally.

A similar program has been in place to address Type B compliance requirements at stations in accordance with the QLD Type B compliance report (from 2015). This report has prioritised work across QLD as a result of a state-wide gap analysis and budget has been allocated to continue to bring all sites up to compliance on a

priority basis. FY17 has allocated budget for design approvals for remaining works on Kogan and Oakey compressor stations. Oakey compressor station design modifications will be implemented in FY18 and Kogan modifications in FY19.

An AS4853 electrical hazard review FEED study was completed in FY15 on the RBP and as a result some minor recommendations have been identified. However, the risk level was deemed as Low in this report and as such, these works have been allocated for FY18 based on their priority level.

4. Asset Risks

This section presents a high level summary of the risks that are currently being managed. These risks generally require funding to effectively mitigate the risk to As Low As Reasonably Possible (ALARP) as required by AS2885.1 risk management process.

4.1 Environmental Risks

Environmental risks are considered as part of the pipeline SMS reviews for specific locations and are typically managed in accordance with the Lands Management Plan as business as usual, unless significant funding is required to be addressed in the asset management plan.

There has been some MEJ funding in 2016 allocated for ROW erosion repairs on the RBP at a number of sites identified by ROW patrols. It is anticipated that after this program of works there would not be a need for additional major funding outside of normal BAU ROW maintenance works. The RBP SMS also recommended some further work be undertaken to establish depth of cover checks at various crossings along the RBP in order to understand any significant risks of reduced cover since the last survey was undertaken. These survey checks will be undertaken as part of operations ROW patrols but some funding has been allocated in MEJ to address this work in FY18 and FY19.

While there are no major environmental upgrade works requiring significant funding anticipated for the RBP or Peat Lateral, APA is in the process of conducting a Transmission Environmental Integration review in FY16. The purpose of this review is to address all updated environmental modules in a workshop format and determine the gap analysis between existing transmission procedures and new environmental requirements. It is anticipated that minor gaps will be addressed through operations procedure updates over the FY17 period and an audit will be undertaken in FY18 to look at any significant areas for improvement. Some MEJ funding will be allocated in FY18 to cover any significant operational spend that may be required as a result of this audit and upgrade to procedures.

4.2 SMS Summary

The Safety Management Study for each transmission pipeline is reviewed for any changes or developments, which may impact on the pipeline. The studies are reviewed at a maximum interval of 5 years or as required in the course of operation should circumstances change, and provide the rationale for pipeline upgrading and the ongoing or routine maintenance and operations activities.

Once approved, Pipeline Safety Management Study reports are located in the Transmission Library with an assigned document number. For the majority of SMSs, these are undertaken utilising a risk database. This is a live database per asset that is located on the local N drive.

Any actions that require major upgrade to the asset are addressed in this Asset Management Plan. Other actions / recommendations are carried out as business as usual works by the applicable department and managed through the APA Work

Management System. These are also detailed in the Pipeline Integrity Management Plan.

The existing SMSs for each pipeline were reviewed during the AMP and budget review process. The predominant SMS review that has a major impact on this AMP was for the RBP metro. Outside of any significant capex budgeted SMS actions, remaining actions are managed via the PIMP as Business As Usual activities, which will be tracked throughout the year.

The RBP metro SMS from 2015 focused on actions relating to external interference protection and these actions specifically included a need for a high consequence area ALARP study, with consideration for slabbing and other significant risk reduction measures in high consequence areas. This resulting study has led to significant funding provision for an RBP Risk Mitigation Project to implement MOP restrictions (with new regulator station installations) and undertake significant lengths of protective slabbing. This has been budgeted in the financial year commencing July 2017 and will continue into FY18 for bulk completion. It is also anticipated that protective slabbing will continue as an annual program to catch additional areas that were not prioritised in the FY17 program. At the time of preparing this AMP, there has also been some funding allocated (previously unbudgeted) to undertake feasibility and FEED works in FY16 to accelerate delivery in FY17 and confirm initial cost estimation. This work has commenced and FEED works are on target to be completed by July 2016.

The remaining RBP SMS workshop (in addition to that covered by the RBP metro scope) was held in the FY16 period. While the final report is yet to be issued, the following are the main items that impact the next planning period on the RBP:

- RBP Risk Mitigation in high consequence areas (to address 3rd party risks) – additional slabbing / signage / procedural measures in rural HCAs in line with the outcomes of the RBP Metro SMS and ALARP works;
- Toowoomba Range new crossing and slope mitigation works – refer to Section 4.3 on integrity risks for more detail;
- Watercourse crossing threat – funding provision for additional easement width at high flood risk crossings to allow for future replacement and/or rectification of any flood damage;
- Further consideration of Toowoomba Station railway accident hypothetical scenario – no significant cost provision allocated currently in MEJ or SIB, but may be considered in future as a result of initial investigation works;
- SCC Mitigation works
- Liquids Management (cleaning pigging on the Peat Lateral and RBP);
- Risk based corrosion / dent excavation program (ref lifecycle plan section);
- Other procedural actions that will be mostly managed as part of normal operational expense including depth of cover checks as part of ROW patrols, emergency plan for creek washouts, CP interference mitigation review

4.3 Integrity Risks

APA has extensive management systems and processes in place to manage and preserve pipeline and station integrity and such processes are compliant with relevant Standards and Regulations.

Management systems employed by APA for integrity management are further defined in the Pipeline Management Plan, but specifically cover:

- PMS which sets out APA's management system approach for the operation and control of AS2885 class pipelines;
- PIMP which sets out APA's approach and program of activities for the overall effective management of both pipeline and station integrity;
- Asset Change Management system which systematically controls, assess and authorise changes to the pipeline infrastructure, procedures processes and controls in a coordinated manner.

The significant integrity risks that are being actively managed on the RBP System are outlined below.

4.3.1 RBP DN250 and DN400 Integrity Risks

4.3.1.1 Structural Integrity Risk

The DN250 line is a tape wrap coated (over the ditch) pipeline that was commissioned in 1969. There has been extensive disbondment of the outer protective tape wrap leading to metal corrosion due the cathodic protection levels becoming ineffective. This is a risk that will require significant ongoing funding to effectively address.

This integrity risk is being addressed by the following actions:

- The excavation and recoating of selected sections of the DN250 pipeline (also refer section 5.1) . During the FY15 and FY16 period, targeted excavations and coating refurbishment was undertaken at a number of areas – as selected by available ILI information on a variety of features, but primarily focusing on dents (with combined metal loss) and MOP impacting metal loss. This integrity upgrade (excavation) program has increased significantly since FY14, with a gradual ramp up to ultimately balance adequate budget versus excavation priority. As a result of this work since FY14, the budget allocated for achieving this balance is an annual target amount as nominated in the Lifecycle Plan section of this AMP. The results of this work is being closely monitored and the annual budget will continue to be reviewed for adequacy.
- A 5 year Maintenance and Upgrade Plan of the RBP CP system has been developed, which has identified a number of bed and CPU upgrades (including infill sites) over the next 5 years. This has led to an increase in funding required per year (minimum), in addition to the related CP telemetry upgrade and associated annual easement upgrade program. Further detail is covered in the lifecycle plan section in 5.3.
- FY14 continuing into FY15 saw the running of a DN250 GE MFL tool to determine the growth in the metal loss features in addition to location of dents and high strain areas (see below). This was followed by a series of

prioritised validation excavations and inspections and then rolling into the significant long-term excavation plan as defined above. This inspection program will continue at a target 5 yearly inspection frequency to meet RLR recommendations and aid in keeping the annual excavation program costs to a minimum.

The integrity of the DN400 loop line is managed in line with APA's integrity management practices. The DN400 line was inspected with a GE MFL tool in 2011. While some features may be prioritised for excavation in the abovementioned RBP Integrity Upgrade Program, there are no significant corrosion integrity issues that aren't already managed as part of standard lifecycle planning (refer section 5.1).

The 2010 ILI results on the Peat Lateral indicated no significant integrity risks to the asset. However, there have been some cathodic protection issues in recent years due to conductive liquids. Further is discussed under Liquids Management in this section.

4.3.1.2 Land Stability Risk

There have been three failures of the DN250 pipeline within the Toowoomba Range area since 2011, two leading to a small loss of containment. All failures were attributed to the yielding of the steel resulting in the development of a circumferential crack-like feature . The failure of the steel is likely to be from near-neutral stress corrosion cracking that developed as a result of significant stresses being imposed on the pipe. These stresses have their origins in the slippage of the surrounding land bought about by the extreme terrain conditions coupled with high rainfall that saturated the ground and thereby initiating ground movement.

The immediate integrity event was addressed by the following actions:

- In the instance of the first failure (2011), the affected section of the pipeline was replaced by a new section under the slippage area;
- In the instance of the second and third failure (2014), a 70 metre section of pipe affected by the leaking defect (140m downstream of the Toowoomba rail crossing) was removed and replaced; deleted - confidential;
- The GE MFL tool records strain data and this data was procured from GE in FY15 for use for targeted strain related excavations. These strain related excavations are now incorporated in the scoping and prioritisation of the earlier mentioned Excavation and Integrity Upgrade Program.

Ongoing actions to manage this risk is as follows:

- Slope stability risks of the Toowoomba Range are further being addressed by the Slope Management Plan as developed in FY16. This plan has identified some recommendations for further managing this risk across the Toowoomba Range by implementing a monitoring program, including LIDAR survey, further geotechnical analysis (stress-state surveys) and installation of strain monitors. These recommendations have been primarily allocated for funding in FY18, with some works to commence in FY17.
- Deleted - confidential.

4.3.1.3 Flood Exposure and Emergency Works

The Roma Brisbane Pipeline (RBP) traverses a right-of-way approximately 440 km in length between Wallumbilla and Brisbane. This region of Queensland has suffered from a number of severe weather events since the major floods of 2010/11. These weather events led to significant damage to the RBP assets. A range of emergency response and repair activities were undertaken by APA. In addition to the submerged meter stations (at Arubial and Redbank), the main emergency response works from these flood events were in relation to land slips at Toowomba and Minden range and watercourse crossing washouts.

The land slip risk management is discussed in the previous section.

Two major watercourse crossing refurbishment works occurred between 2011 (Rocky Creek) and 2013 (Sandy Creek). Both creeks sustained significant washouts and the pipeline was exposed and damaged in some areas. Rectification involved significant bank restoration works in conjunction with inservice lowering of the pipelines.

In addition to the ongoing strain monitoring discussed above as part of the ongoing ILI schedule, a further risk mitigation measure is to implement a wider pipeline easement in areas where any future flood exposure risk is high. Some budget has been allocated in the 5 year plan to undertake these works on a priority basis, utilising the existing anode bed easement costs as a cost basis. Emergency spares also continues to be an annual consideration in the capex budget, but these are currently being managed by the national emergency response register and current supplies are adequate.

Isolation Plan upgrades have also been budgeted from FY17 – FY19 to address recommendations in the pipeline isolation plan, which further aids risk mitigation from future events.

4.3.2 RBP Metro Integrity Risks

The original DN300 line that runs from Bellbird Park to SEA block valve was commissioned in 1969 and is around 37.6 km in length. The line has a MAOP of 4,612 / 4200 kPa and runs through the heavily populated section of metro Brisbane. The line was last inspected with a GE MFL tool in 2011 and due to the condition of the pipe and primary location in high consequence areas, a 5 yearly inspection interval has been imposed meaning that the line will be again inspected in end 2016. It is noted elsewhere in this plan that this section of line has also undergone RLR and SMS in 2014-2015.

The original DN200 line that runs from SEA block valve to Gibson Island was commissioned in 1970 and is around 2.2 km in length. The line has a MAOP of 4,200 kPa and runs through the heavily populated section of metro Brisbane. The line was last inspected with a GE MFL tool in 2011 and due to the condition of the pipe, a 7 yearly inspection interval has been imposed meaning that the line will be again inspected in 2018. It is noted elsewhere in this plan that this section has also undergone RLR and SMS in 2014-2015.

3rd party works has also been identified as a key risk to the RBP metro pipeline. This has been outlined under section 4.2 of this AMP (SMS).

In addition to the integrity risk on the metro RBP, an AS4853 mitigation study was undertaken in FY15 and as a result some funds have been allocated in future years to address risks of OHS hazards in the metro area from high voltage power lines in the vicinity and ensure that compliance to AS4853 is met.

Similar to that mentioned for the RBP DN250, an Isolation Plan was finalised in FY16 and as a result, a number of recommendations have been included in the 5 year plan for station upgrades to address isolation requirements in the RBP metro. These include vent stack redesign and 4 metro sites, and actuation of key MLVs.

4.3.3 SCC Mitigation – RBP Mainline and Metro

The RBP, especially the DN250, meets the criteria for susceptibility to near-neutral pH stress corrosion cracking (SCC). These criteria include the age of the pipeline, steel metallurgy of the time, lack of abrasive blasting of the pipe surface before coating, use of the PE tape coating system, and potential shielding of CP by disbonded tape coating. In terms of pipelines both axial and circumferential cracking is possible. Both types of cracks, to differing severities, have been found in RBP.

The RBP has an actual history of leaks resulting from circumferential cracks – 1983, 2011, 2014. The exact nature of this failure was not fully understood until 2014 as it is an unusual failure mechanism, related to areas of high curvature and bending strain over a period of time. Strain features were subsequently included in the RBP excavation and integrity upgrade program in FY15.

With the presence of SCC features identified in the RBP mainline, as a result of both the emergency works and followup strain ILI prioritised excavations, an SCC Management Plan has been approved for the RBP. This plan outlines the requirements to mitigate SCC on the RBP, including timeline requirements for further action.

Axial cracks provide the highest risk of rupture particularly if their length exceeds the critical defect length for the pipeline. Rupture could occur anywhere in the pipeline as internal pressure provides the tensile force. Significant axial cracks have been found in only one discrete location at this time and were associated with unusual pipeline stress and strain conditions. CEPA guidelines apply (as outlined in the SCC management plan). In order to check for this failure mechanism, crack detection ILI is proposed for all of RBP DN250 and DN300 in the SCC Management Plan. The EMAT tool was run in 2016 for DN300 Metro (this was also a check of pipeline seam weld integrity for a pipeline of this vintage)and further EMAT inspection is planned for all DN250 segments once a DN250 tool is developed (a tool for the DN250 is anticipated to be available within the next couple of years). Ultrasonic testing by ILI, while a proven technology for crack detection, is not feasible for gas pipelines without inserting a large liquid slug which is not practical in the RBP without major impacts to distribution network customers and appears unsuitable for areas with rapid elevation change.

In addition to SCC ILI, APA is also undertaking SCC direct assessment at all excavations; this involves 100% coating removal and crack detection by magnetic particle inspection, which increases dig cost and duration. The coating upgrade at digs include abrasive blasting of surface and liquid applied epoxy coating

At the time of writing this AMP, the DN300 EMAT inspection results haven't been formalised but it is intended to incorporate any required excavations as part of the total excavation site prioritisation process.

Outstanding moderate strain event location excavations will also be prioritised within the RBP Integrity Upgrade Program scope. One exception to this is the Condamine River crossing, which is the only location not yet excavated with a reported strain event being > 0.3% strain. Given the significant nature of this excavation, this has been budgeted as a separate project (incorporating additional environmental works and approvals) by FY18 at the latest.

4.3.4 Station Fire Risks

FM Global (APAs insurance assessor) undertook an audit in 2014 to address station fire related risks. A resulting FEED study was undertaken in FY15 to assess fire hazards in compressor enclosures and control rooms across all assets in QLD and determine any actions required from a risk-based analysis. Some sites were assessed as requiring additional fire suppression and these are being addressed in both the FY16 and FY17 SIB programs.

4.3.5 Liquid Management

A number of QLD assets have had periodic issues with liquids. While some of these issues have most likely been in place for a number of years, more recently these have been causing specific problems at a number of locations. These are generally associated with coal seam gas inlets (glycol, compressor oil, coal fines) and are summarised as follows:

- Peat Lateral: cathodic protection issues from insulating joints being bridged. This problem has occurred periodically over the past few years and current practice is to undertake cleaning pigging as required in order to maintain CP (the line is predominantly protected by sacrificial anodes, but additional cross-bonding to the RBP has been done). When the bridging occurs, the CP levels are significantly lower than required to provide protection;
- Wallumbilla meter station: Issue first raised by control valve operational issues, which was particularly noticed in conjunction with erratic gas flows through the RBP reverse flow skid. Liquids are currently being collected routinely through the basket strainer on the reverse flow inlet to SWQP from RBP;

For all items, the short-term management is to undertake regular cleaning pigging programs in conjunction with periodic liquid drain collection at Wallumbilla, and to monitor liquids collected over a 12 month period. Once adequate data has been collated and assessed, a permanent approach can be implemented, which may also include commercial discussions for various receipt points as applicable. A temporary work order has been added to the works management system (with an associated MOC until such time as a permanent solution is found) for cleaning pigging at a 3 month interval on the Peat Lateral and Wallumbilla-Condamine section of the DN400 RBP and a 6 month interval on Yuleba-Condamine section of the DN250 RBP. This cleaning program is also being implemented on other APA assets which have the potential to impact liquids issues to ensure adequate data is included for consideration of a permanent solution.

Further to this interim solution, to ensure efficient liquids collection during cleaning pigging, it has been recommended to construct a portable liquid drop out vessel for use during cleaning pigging. Subject to the outcome of liquid collection works in FY17, future measures will be refined for subsequent years, which include permanent liquid drop out vessels at Scotia and Woodroyd on the Peat Lateral and on the RBP DN400 reverse flow skid.

4.4 Supply Integrity

Supply integrity is ensured by a combination of the following operating strategies:

- Ensuring that equipment remains fit-for-purpose through maintenance and enhancement programs;
- Utilisation of a Plant Release system for critical equipment release for maintenance;
- 24/7 monitoring of pipeline and station critical performance criterion;
- 24/7 staff call-out for rectification of failed critical pipeline and station equipment;
- Compressor down-time maintenance is scheduled to cause the least impact to gas deliveries.

With recent emergency works undertaken since the 2011 for flood and slope instability threats, it has been identified that where practicable, existing offtakes off the DN250 mainline should be considered for duplication off the DN400, to ensure supply integrity. This is similar to the outcome achieved as a result of the Toowoomba range emergency works where a new MLV and offtake was installed off the DN400 looping line to Toowoomba Meter station. Provision has been made in the 5 year plan to install new offtakes at the remaining DN250 offtake sites on the DN400, to increase security of supply. The majority of these new offtakes apply at above ground stations such as Oakey Sales Station (to Oakey distribution network) and Dalby Station (to Biorefinery). The priority on these above ground sites are slightly lower, due to the potential ability to provide supply through alternate valving at the site to access the other side of the main isolatable sections. There is one below ground site at Riverview that is currently on the RBP mainline, that may need a back up connection to the DN400. This has been allowed for as a first priority in FY19 and cost estimate has been based on similar works at Toowoomba.

While some projects in the 5 year capex plan will have an impact on increasing supply integrity (ie fire suppression), there are no other major capital or major opex works planned that are primarily due to supply integrity concerns on the RBP.

4.5 Facility Operation, Process and Safety Risks

Due to the age of the asset and incremental growth and expansion over time, many of the facilities on the RBP require upgrades and modifications to meet current Australian and APA standards. A programme of retrospective HAZOP studies was commenced in 2014/15 which identified a number of actions across various sites. Other engineering studies including development and review of pipeline isolation plans have also identified upgrade requirements.

Typical categories of facility upgrades of this nature include:

- Pipeline, PSV and station automatic and manual vent release points – location, proximity of release point to vent valve and operator, plume dispersion and radiation contour radii;
- Pressure and temperature control and overpressure protection – mechanical controls and instrumented protection systems
- Pipe support condition and pipe stress scenarios due to ground movement
- Removal of redundant equipment
- Replacement or overhaul of equipment such as valves that have reached end of life or are in a deteriorated condition.

More detail is covered under the Lifecycle Plan section of this document.

5. Strategic Lifecycle Plan

5.1 Pipeline Integrity Plan

Corrosion is actively managed by a combination of the following strategies, as defined in the PIMP (refer to the cathodic protection section further below for any cathodic protection mitigation items):

- In Line Inspection (ILI) programs utilising Magnetic Flux Loss (MFL) technology and incorporating additional options for geometric analysis for dents. This includes other ILI techniques for SCC for specific assets as specified under section 4 for Asset Risks.
- Corrosion repair and integrity upgrade programs whereby selected corrosion defects are identified for excavation, inspection, repair (where required) and refurbishment. The program also addresses dents in the pipeline that may or may not have associated corrosion or cracking.
- Indirect (DCVG), and potentially direct as a follow up, inspection of older buried station pipeline and coating that cannot be inspected by MFL ILI. This pipework is typically at scraper and mainline valve sites and scheduled via the works management system.
- Engineering assessments and program re-evaluation following receipt of new inspection and/or field data.

The CAPEX budget impacts from the above integrity items include a continued ramp up of the annual RBP integrity upgrade (excavation) program up to an amount over $4M per year to address ILI features ranging from Dents, strain locations and metal loss (with associated calculated annual growth rates taken into account). The driver of this program is outlined in the earlier section in this AMP on Asset Risks. In the last two years, 35 excavations were achieved in FY15 (for approx. $1.5M) and 75 excavations were achieved in FY16 (for approx. $4M). The cost of this work is greatly dependent on the location of these excavations (rural versus Brisbane metro) and the target excavation length, and the contracting strategy of this program is constantly being refined (including the estimating process) to ensure the correct balance is being achieved between budget and excavation priority.

It is based on the past ILI results and experience during the excavations that we are projecting similar number of excavations in future years. APA has in fact prioritized the proposed excavation numbers in FY15 and 16 to defer some of the work to prudently manage the expenditure. This results in a program of typically 100+ excavations per year.

The table below sets out the forecast number of excavations and upgrades for the next 6 years and corresponding budget.

Year	FY17	FY18	FY19	FY20	FY21	FY22
Excavations	108	115	130	91	85	100

It is noted, that the repeat ILI of the DN250 pipeline is scheduled for FY19. When this ILI is completed, further comparative analysis will be done to reassess corrosion growth rates and reprioritize remaining excavations.

ILI runs are budgeted in the 5 year plan based on the target ILI schedule specified in the PIMP.

Specifically for 2016 to 2017, this results in 3 additional ILI runs being required on the RBP. First priority is for the DN300 metro ILI run (5 year ILI interval based on APA integrity recommendations and location in high consequence area) in late 2016. The DN200 Lytton lateral (part of the RBP license) is due for its first ILI as part of the 7 year strategic requirement in the PNG Act in 2017. The Collingwood Ellengrove lateral has been targeted for a 10 year re-inspection interval based on the results of previous ILI, which will align with the upcoming RBP looping ILI schedule given it is of the same diameter.

To enhance cost efficiency of the above ILI program, it has been identified by reviewing the intelligent pigging contractor cost schedule that there is a significant cost impact to the overall ILI program due to the number of pigable sections. A significant cost savings is anticipated from consolidating the 7 pig sections down to a practical 4 pigable sections per pipeline. There are minimal issues with achieving this (while still retaining existing spec breaks and existing bi-directional section logistics), considering the existing sections are short (approx. 50km). Typically, at many scraper stations the launchers and receivers could be removed and replaced with straight-through pipe spools for a fairly small cost, depending on pipe stress and whether expansion loops required for thermal stresses. At all sites except Oakey the receivers line up directly with the launchers. The intention of this work would be to only keep pigging facilities at operational mainline filter and/or compressor sites or MAOP spec break sites, and at Oakey. This is a cost-beneficial option, which is anticipated to save between $400k and $500k per pigging run at a total one off cost of approximately $400k for both lines. Budget has been allocated for this work in FY18 and 19.

The OPEX program continues a $100k annual budget for RBP excavations as part of ongoing annual maintenance requirements, which is to be delivered as a separate program to the Major Project Integrity excavations above and targets any unplanned emergency repairs as required.

5.2 Station Integrity and Compliance Plan

Station pipework is maintained to ensure that the MAOP of the pipework is not compromised. Buried station pipework is protected with Cathodic Protection which is applied and maintained in accordance with AS2832.

Compressor stations are operated to ensure that the MAOP of the station and recipient pipeline is not exceeded. Compressor stations employ a series of hierarchical protection systems to ensure that the design limits of the station is not exceeded; the protection systems are inspected and tested on an annual basis.

The items identified as part of the station lifecycle upgrade plan on QLD assets are typically driven out of compliance requirements for Type B, hazardous area and pressure vessels. The compliance driven programs are further detailed under section 3.3 of this AMP.

A pressure vessel upgrade program has been in place to resolve major issues raised by the pressure vessel inspection and test program. Works have been performed and are ongoing to verify design documentation and undertake further design

calculations and pressure testing as required. This program has also incorporated tasks to improve vessel over pressure protection with new PSV installation. More information can be found in the Pressure Vessel upgrade project plan FY15/16.

Gas measurement upgrade being considered for all sites in QLD, including RBP. FEED works will have to be undertaken first to determine potential improvements but some minor allowance has been incorporated for meter upgrades.

The only other identified mechanical lifecycle plan items for stations are HAZOP station upgrades and Isolation Plan upgrades (both on the RBP). These programs are to implement actions out of these works undertaken in FY16 and the items have been spread over a 3 year period from FY17 onwards. Part of the program will also include some of the scope for completing the decommissioning of the S20 compressors (refer to rotating plan section). The high level scope of these works across the 5 year plan are as follows:

- Upgrade station protection from external threats including fencing, signage and fire break adequacy; (FY17)
- Minor station upgrade works at scraper stations to meet HAZOP actions, including earthing of vent points (maintaining CP isolation) and further design review at Wallumbilla and Redbank; (Dalby & Yuleba in FY17)
- Redesign of vent stacks at MLVs (14 sites) and Compressor Stations for safe pipeline blowdown (FY18)
- Actuate key MLV's for remote operation – including metro section (FY19)
- Completion of minor capital works pertaining to S20 decommissioning requirements (FY17);
- Further minor station upgrade allowance continuing from FY20 onwards to address other issues as have been typical over the past 5 year plan.

Further to the HAZOP works identified on the RBP stations, a review of all stations in QLD is being undertaken in FY17 to determine the status of Safety Instrumented Systems. Further SIL studies are likely to be required as a result, which may involve further system upgrades, including consideration of safety instrumented system software. Some allowance has been incorporated for this work as a followup to the FY17 audit.

Aside from those items designated as lifecycle plan upgrades, there are a number of other station upgrade projects identified for FY17 and FY18. These are itemised in the capex AMP 5 year plan.

5.3 Cathodic Protection Plan

Cathodic protection is managed by the following measures as defined in the PIMP:

- Annual Cathodic Protection (CP) survey, and 6 monthly in urban areas, to determine the level of protection that is being applied by CP units. Data from the CP survey is used to determine the location of additional CP sites or existing sites where increased output is required to ensure adequate protection levels are obtained.
- Cathodic protection system augmentation program whereby additional (or upgraded) CP rectifiers are installed at specific locations on the pipeline based on the above surveys. The program also replaces anode ground beds that are

failing and incorporates any requirements for ensuring anode bed easements are valid.

- Specific maintenance regimes for the maintenance of CP rectifiers and associated installation.

An aging pipeline and ongoing coating deterioration requires significant investment in CP upgrades. All CP systems on RBP are under heavy load due to the high current demand, particularly on the DN250 pipeline. Currently, the DN250 and DN400 RBP lines are cross-bonded at many locations to improve distribution of CP current consistent with the CP Plan.

The requirement to increase the annual program is demonstrated in the 5 year Maintenance and Upgrade Plan of the RBP CP System, which documents the actions required for ensuring the cathodic protection levels are adequately maintained. The annual upgrade program of CP systems is to manage both end of life of anode beds, and to deliver an increase in current output capacity of systems. This is delivered by new TR units and anode beds, new land easements to locate anodes further from pipeline and the installation of new CP systems to infill low protection areas between existing systems. The 5 year CAPEX plan has been updated to incorporate an increase in the annual RBP & Peat Lateral CP Upgrade program.

There are 69 CP units currently on the RBP. The typical anode bed life is 10-15 years meaning that on average 5 or so anode beds per year require replacement. Due to increasing requirements and technology changes the anode beds when upgraded often need to be physically larger and also need to be located further away from the pipeline to improve CP current distribution, meaning that additional land is required. Land requirements include easements and new or improved landholder agreements.

In addition to the increase in the annual RBP CP upgrade budget, the RBP CP telemetry upgrade program has been continued at $150k per year. As the coating condition is poor, RBP corrosion protection relies heavily on CP. Awareness and repair of CP outages is vital and currently relies on field staff travelling the pipeline right of way fortnightly to check CP units. At times access may be impossible due to flooding. Remote telemetry brings the CP unit data (output voltage and current, pipe potential where available) back to SCADA enabling APA control room and engineering staff to see trends live and raise corrective work orders for field staff if power is lost or a CP unit fails. This removes the risk of unit/s being offline for weeks or months depending on field scheduling, ROW access, weather etc. This brings the RBP into line with current industry practice for pipeline CP monitoring.

In conjunction with these annual capex programs, the CP easement upgrade program is also required to support this (refer Section 5.6).

The 5 year OPEX plan has been updated to include an annual allowance for RBP CP interference testing and mitigation on the RBP. There have been a number of locations identified that require testing and mitigation as a result of recent CP unit upgrades in addition to 5 yearly CP registration expiry. A target amount of $100k per year has been allocated to cover contractor testing in addition to anode and test point installation on third party assets where required. This program is driven out of statutory compliance requirements.

5.4 Electrical & Instrumentation Plan

Electrical equipment that is installed at Stations is maintained and tested in accordance with relevant Australia standards and administered by specific maintenance regimes within Maximo.

Hazardous area compliance issues have been identified at the older gas compressor stations and the provision of suitable funding has been made in the forthcoming five year plan to investigate and recommend remedial solutions. This is being addressed as an annual program of a combination of audits and dossier updates with upgrades to address inspections. This is further outlined under the compliance section 3.3.

There has been an ongoing RTU and Flow Computer upgrade program on the RBP assets to address obsolete station controllers and flow computers. These were identified as a critical risk to pipeline control, as their reliability has been established to be low and numerous failures have occurred in the past. This program was mostly completed on the RBP in FY15, with some carryover to finish works in FY16. There will still be some sites with obsolete controllers such as the S20 compressor stations, but these upgrades were placed on hold subject to decommissioning outcomes.

Other RBP stations yet to be upgraded are partially client owned and as such also depend on long term end user usage (ie Swanbank and Gibson Island) but existing spares made available from other station upgrades can be used in the short-term.

5.5 Rotating Plant Plan

Rotating plant is operated, maintained and overhauled in accordance with Original Equipment Manufacturer (OEM) requirements and newly implemented EAM regimes.

APA has instituted a condition monitoring regime which conducts oil analysis at prescribed intervals and internal bore-scope inspections of the equipment internals to predict failures. Vibration analysis and performance monitoring of rotating equipment is also undertaken which, again, is a predictive analysis tool.

The major ongoing capital expense for rotating plant is as a result of the major engine and compressor overhauls, which are typically planned around run time. The only capex item for RBP rotating plant in the next 5 years has been identified as the Dalby Centaur C50 Turbine. This has been earmarked for FY22, but the exact scheduling will depend on its annual use and when it is likely to reach 50,000 hrs run time, as per the EAM regime. The estimate for this is based on the existing Solar contract schedule for overhaul costs – which for a C50 is approximately $1.3M.

Early in 2016 the RBP Compressor Operating Philosophy was approved for use and published on the Transmissions document library – reference document number 320-POL-AM-0023. In addition to documenting the recommended maintenance and sparing philosophy for the rotating plant on the RBP, this document has led to the decommissioning recommendation of a number of S20 compressors on the RBP. While these compressors have been isolated, they have not yet been removed and there is a significant scope of remaining pipework and ancilliary equipment that needs further removal and in some cases upgrade of existing boundary points within the remaining operating pipework within these stations. MEJ funding has been allocated in FY18 to complete the S20 decommissioning works. Any capital works to

the stations, as recommended by the S20 decommissioning FEED report, will be incorporated as a part of the Station Upgrades projects between FY17 and FY19.

5.6 Easement Plan

The National Lands Management Plan (LMP) sets the policy, management and maintenance requirements for easements and third party activity management and therefore identifies and establishes any Major Expense Jobs that are required for easements based on easement audits and third party activity risk assessments.

General ongoing easement maintenance is funded and delivered from annual Opex budgets; Capital expense provision for easements is only in relation to the acquisition of further easements for new pipeline and ancillary infrastructure needs and is typically funded through a parent project on a case by case basis.

A number of anode beds on the RBP have been in operation without easement documentation and as a result, an Anode Bed Easement program has been underway. After FY16 works implementation and associated reimbursements to land owners, the current annual program is insufficient to fund the desired amount of beds per year and as such, this program has increased to a target $210k per year (for a nominal 10 easements per year). This will also cover any infill sites as deemed required by the CP Upgrade Program. At the time of writing this plan, there are still close to 50 anode bed sites that are without easements.

6. Performance

6.1 Operational

The following table presents performance measures relating to operational supply performance of the RBP for the FY16 period. The commentary further below covers any relevant items that contribute to the overall asset performance across the financial year and any items that need additional consideration for major funding. HSE performance is managed separately through Safeguard and is not included in the AMP.

Table 3 –Supply Performance Measures

	Requirement	Measure	Target	Result for FY16
	MAOP breaches	Nil	0	0
	Failure to Supply	Nil	0	0
	Number of pipeline incidents	Nil	0	0

Commentary

6.1.1 Incidents

There were 3 unauthorised encroachments on the RBP this financial (FY16). These were:

- Vacuum truck excavation (with some hand digging) down to 500mm over the RBP at Windibri (MP 76);
- Vacuum excavation 50mm deep across Junction Road verge at Karalee (metropolitan area);
- Mechanical excavation works for new sewer and water service (on opposite side of road to the pipeline) in metropolitan area at MP269;

Specific actions for each encroachment have been identified and are managed within the lands management database. These include transfer of APA asset data to the Windibri 3rd party owner and Gas Awareness presentations to the metropolitan third party encroachers. Encroachment is otherwise managed in accordance with the Lands Management Plan and in particular through DBYD and the development application process. In addition to this, there is a current program in the RBP metropolitan areas in 2016 for undergoing an easement management review (by an Easement Management Program), which includes landholder liaison, training of land procedures, review of non-compliances and continual audit process.

There were no Environmental incidents recorded for FY16 for the RBP.

The RBP has undergone some temporary MOP reductions throughout FY16 to manage MOP impacting corrosion and dent features, in conjunction with the Integrity Upgrade Program. These have been managed through the MOP Change Management Procedure.

6.1.2 Availability / Reliability

Operational availability (hours available / hours in the month) has been reported for assets on average since November 2015. This average is reported for the RBP as 87.4% availability, which includes planned maintenance and has been more recently impacted by some station work at Kogan making the compressor unable to use. This availability level has not posed any significant concerns to maintaining supply, based on the current operating philosophy for the RBP. Reliability levels are also reported at a high level, in terms of hours used versus trips. Some of these figures imply a relatively low reliability for the high availability numbers being reported. Maintainance of low use compressors is being considered to ensure high reliability for the relatively low availability requirements of the pipeline, to ensure supply integrity risks are mitigated.

Supply integrity risk for the pipeline has been addressed earlier in section 4.4. Aside from the pipeline supply risk commentary, there have been no other issues identified for major funding on the RBP pertaining to availability and reliability of compression assets.

6.1.3 Maintenance

FY16 saw major impacts to planned maintenance works with an operational change within APA to a new maintenance works management system (Maximo). These impacts are being addressed through further enhancement of the maintenance system, including review of frequencies for certain planned maintenance on some assets. This will include an operational review of the PIMP for currency.

PM completion is currently reported monthly as a KPI amongst varying categories via the IOC. This report looks at critical PM completion, patrol compliance, CP PMs and other operational KPIs such as third party liaison visits and engineering service requests. While individual asset performance status is not currently reported, the results are managed by Transmission and any critical areas for improvement are addressed accordingly either via change requests in an MOC or for new funding requests where applicable. Statutory work orders are the primary focus for scheduling.

A summary of the recent status for operational maintenance on the RBP is as follows:

- Attention and resources have been allocated against CP reads and anode watering to ensure protection remains a high priority of the DN 250 line;
- Aside from integrity impacts, the main item being considered for maintenance review is with the scheduling of S20 compressor services (for compressors with lower use), with consideration for time-based scheduling rather than on hours use. This is likely to ensure high reliability for the low hours run time (as reflected in section 6.1.2). This review will not impact any major funding incorporated in this AMP.

6.1.4 Integrity

Integrity performance has been addressed elsewhere in this document and has been the driver for major capital funding in the next 5 year plan. A number of key performance indicators are reported on a monthly basis to monitor integrity performance, which include SMS and RLR reviews currency, SMS actions status and

regulatory incidents & reporting. The reporting register status (including operational review requirements) are addressed in section 3.3.2, which state SMSs and RLRs that are planned for 2016. The latest RBP SMS summary and related SMS actions requiring funding have been addressed in section 4.2.

CP performance is measured monthly by reporting % protected of the total line based on monthly test point reads meeting the minimum guidance value required from annual survey requirements. Note that the next annual CP audit report is due in November 2016.

Current operational results for CP show that for the two sections between Wallumbilla and Condamine require attention to ensure high percentage of protection is achieved. The remaining sections of the RBP west of Brisbane gate stations are reporting between a high percentage average protection levels across mainline and looping. The majority of the metro area has good protection levels. While these figures are only applicable for operational "ON" potential reads, this gives an indication which supports the current focus on CP upgrades on the areas further west on the RBP.

6.2 Project Delivery

This section presents a high level review of the projects that were approved in the Fy16 capital and operational budget as well as the FY16 BAU works plan. The review details:

- FY16 performance summary
- Overall FY16 capex budget summary;
- Significant projects and works that were undertaken;
- Unbudgeted projects that required re-prioritisation of the FY16 program.
- Projects that were not fully delivered and carried over into the current Fy; and
- Projects that were deferred or cancelled.

6.2.1 Major Capital Expenditure (CAPEX)

Table 4 – Fy16 Capital work program – RBP & Peat Lateral

Financial Year	Approved Budget	Final Program Cost	Variance	% Variance%
FY16	$7,310,000	$7,050,000	+260,000	3.6%

Commentary

This program covered an amount of 21 projects for delivery – with 5 of these projects being out of budget and some projects requiring significantly more budget than was originally allocated. These additional items are summarised below:

- 2 of these out-of-budget projects were > $100k in value and both were as a result of the DN250 Integrtiy Upgrade works. It was determined that to bring in some efficiencies through the delivery of the program and to ensure data quality inhouse, to procure a 3D laser scanner for the purpose of some NDT to be undertaken inhouse using quicker and more modern technology. This also resulted in some cost savings to the project for NDT contractor works. In addition to the 3D laser scanner purchase, it was also identified that the current long-term storage capabilities of spare pipe for emergency

use was inadequate and as such an additionl project was funded for emergency pipe storage facility at Gatton.

- Sandy Creek Meter station was a minor cost carryover from FY15 that was unbudgeted in FY16;
- A minor FEED project was undertaken from the recently produced RBP Isolation plan to determine scope and requirements for piping isolation and blowdown upgrades in future years;
- A further minor purchase was funded for CP data collection software and unit – which is being undertaken as a trial in QLD specifically for the RBP to improve on maintenance efficiency and data review.

Some projects in FY16 were delivered at values significantly differing to what was budgeted (some over and some under). These major differences have been summarised below:

- Integrity Upgrade project increased by $1M due to the re-allocation of opex costs to capex costs, in addition to additional funds required to deliver scope due to locating difficulties and additional repairs than budgeted.
- Vehicle Mitigation upgrades, CP Telemetry Upgrade and Murrarie Erosion control project equated to a total increase of $390k over budget, mostly due to unbudgeted carryover work from FY15 and increase cost for external contractor works due to resource limitations on CP telemetry. In the case of Vehicle Mitigation, there was also more work than previously budgeted to adequately achieve protection at the stations, which also led to an increase.
- Swanbank MLV installation is forecasting a $215k increase over budget (most in FY16), due to materials costs coming in higher than originally budgeted and excavation challenges in rock.
- CP Upgrade Program also required an increase in what was budgeted $150k – due to a decision to purchase additional TR units for install in FY17 and increase estimates for contractor works;
- Deleted - confidential.

With the above major budget discrepancies addressed, the key projects that were undertaken in FY16 are highlighted below:

- RBP Integrity Upgrade Program – cost $4M: Completion of 79 excavation sites for refurbishment across RBP – including 16 sites in the metropolitan area. The project was delivered as part of APA Major Projects (in accordance with the approved procurement processes) and further efficiencies will be evaluated for inclusion in future work programs. There were some issues that led to additional costs such as pipeline feature and girth weld location and compression wrap requirements being higher than anticipated. As-built data will be utilised to re-evaluate the excavation priorities for FY17 upgrade program, incorporating any carryover sites not inspected and other identified features where applicable;
- RBP DN300 EMAT SCC/ Longitudinal seam inspection – cost $870k: Completion of EMAT inspection program on DN300 metro line, inline with customer shutdown to achieve the required minimum flows. The inspection component of the work ended up costing less than was budgeted, however due to the request for an immediate validation

excavation program at 4 sites, these costs incorporated excavation of the sites in June to aid in the final report;

- Swanbank Isolation Valve Project – cost $715k: Installation of additional MLV on the Swanbank Lateral downstream of the Ellengrove lateral offtake to enable isolation of the Swanbank leg while maintaining flow through the Collingwood Ellengrove Lateral to Brisbane. This was an identified action out of the prior Isolation Plan as a mitigation measure against either coal fire or ground subsidence risk to the Swanbank Lateral. There is some budget in FY17 for minor carryover works.
- RBP CP Upgrades – cost adjusted to $450k: Installation of CP Anode beds and additional CP upgrade works as identified by CP audit reports including cross-bonding. This cost also included purchases of additional Transformer Rectifier units for FY17 works. Anode bed installations were significantly impacted by legal approval of easements (as part of the Anode bed easement upgrade program) and 3 out of the targeted 6 sites were completed due to this delay. Actual costs are similar to what was approved by the AFE due to re-prioritisation of work to accommodate this delay and ensure other works such as cross-bonding and TR movement continued.

6.2.2 Major Expenditure Jobs (MEJ)

Total MEJ budget for FY16 on the RBP was $290k and $378k is being forecast for completion with the major items / changes summarised below:

- Signficant works undertaken for station painting on the RBP over what was budgeted across a number of sites in both RBP metro and RBP west;
- RBP S20 Decommissioning FEED (and minor modification) works were undertaken in FY16. This work underwent a change to opex funding allocation, which meant this wasn't originally budgeted in MEJ. This work has led to a number of recommendations to complete the decommissioning of the original S20 compressor sites (aside from Kogan and Oakey), which will be undertaken in future years on a priority basis.
- RBP Emergency Pipe Hydrotest: works were undertaken to hydrotest existing spare pipe for emergency use on the RBP.

6.3 Business As Usual (BAU)

The OPEX expenses for operating the assets for the previous three financial years is detailed below, these costs exclude corporate overheads:

- Fy14 - $8.6m
- Fy15 - $8.3m
- Fy16 - $8.0m

Engineering BAU works incorporate the required integrity review works on the assets such as Remaining Life Reviews and Safety Management Studies where required, unless external contractors are required for these studies (which are funded as MEJs). Major activities that impacted opex expenses on the RBP in FY16 are:

- Toowoomba Second Range Crossing encroachment;
- Change over to EAM maintenance regime;

However, these figures do not vary greatly in comparison to previous years' spend and it is anticipated that this annual spend is not likely to change moving forward.

6.4 Growth Projects

The only major Growth project that was delivered (by Infrastructure Construction) for the RBP during Fy16 was the RBP Reverse Flow project.

6.5 Works Outstanding – Risk and Mitigation

There were 6 SIB projects cancelled or deferred in FY16. 3 of these were FEED projects and the rest were only minor SIB delivery projects. These were all risk assessed to ensure they were safe to cancel or defer.A summary of these is below:

- Dalby C50noise mitigation FEED (original budget $10k – agreed not required as no integrity concern with vibration nor noise HSE issue);
- RBP Mt Gravatt MLV Upgrade - $20k: continuation of compliance works for MAOP transition. Superseded by ALARP mitigation study undertaken in 2015 and resulting FY17 ALARP mitigation project will remove this non-compliance;
- RBP AS4853 Electrical hazards mitigation - $50k. FEED report identified only minor items as potential improvements for consideration at test points and these were low risk and not critical. Project deferred for FY18 to address compliance differences.
- RBP Type B Gas Compliance upgrades - $50k. Funds transferred for Type B works on other QLD assets, determined by priority for delivery. Remaining RBP Type B compliance works are budgeted for FY17 – all works in QLD are being addressed on an delivery annual program.
- Toowoomba station heater installation FEED was deferred until FY18 – this was due to recent station upgrade works that have occurred on this station. Review of station temperature data will included as BAU opex works throughout winter and will be monitored as operating conditions change on the RBP (particularly with the RBP Risk Mitigation works in FY17). There are no immediate temperature concerns at the station currently that require this work to be expedited.
- Water Easement Emergency Preparedness FEED – cancelled in FY16; Emergency Response is now being managed nationally to ensure adequacy of emergency fittings. Easement procurement has been budgeted in the upcoming 5 year plan for widening of pipeline easements in high risk creek crossings;

There were two MEJ projects that were not completed in FY16. These were the ROW erosion repairs and loss of cover assessment. Loss of cover assessment will be managed as BAU works through FY17 as part of the ROW patrols and some funding has been allocated for follow up in FY18 to ensure SMS actions are completed. ROW erosion repairs will need to be managed as part of the FY17 MEJ budget. There is an ongoing allocation for ROW erosion repairs as required in the 5 year plan to manage any ongoing issues.

7. Planned Works

7.1 CAPEX – FY17

The FY17 Capital budget has been identified as $15,540,000.

Significant project allocations that impact this budget are (projects greater than $500k):

- RBP Risk Mitigation – FEED and IMPLEMENTATION: $8m

Works incorporate RBP Pressure Management and Physical Protection Barriers installation on the RBP in High Consequence Areas across the DN250, DN400 and DN300 pipeline from Brightview to end of line. Scoping and FEED has been completed in FY16. Works delivered by Major Projects.

- RBP DN250 Integrity Upgrade Program: $4.9m

Lifecycle upgrade annual program for integrity excavations on the RBP. Prioritised excavation program based on ILI data, SCC Management Plan and recent excavation works. Refer section 5.1 for more detail. Works delivered by Major Projects.

- RBP CP Upgrade Program: $0.63m

Lifecycle upgrade annual program for CP augmentation to manage required current demand and end of life of anode bed installations, including infill site installation and bed relocation. Works delivered by RBP operations and engineering.

Further detail in relation to the actual FY17 capital work program is in the appended AMP 5 year capex plan. This includes some carryover work from FY16, however this work has been planned and budgeted accordingly.

7.2 OPEX – FY17

There has been no allocated MEJ opex budget for FY17.

7.3 BAU – FY17

The engineering BAU work for Fy17 continues to concentrate on:

- Safety Management Studies (SMS) reviews for the following pipelines:
  - Peat Lateral Pipeline due end 2016
- Remaining Life Reviews (RLR) for the following pipelines:
  - RBP rural (DN250 only) target August 2016;
  - Peat Lateral Pipeline due end 2016;
- Review and update of Isolation /Fracture control plans for the following pipelines:
  - Peat Lateral Pipeline
  - Peat Lateral Pipeline

7.4 Five Year Capital Expense Funding

A Five Year Plan which details the Capital expenditure profiles is attached in Appendix A; the plan covers the planning period from FY17 to FY22; the plan also includes MEJ funding provisions.

The plan identifies specific items and associated costings that are considered essential to maintain the pipelines in a Fit-For-Purpose condition. The plan however does not consider growth projects.

The plan is forward looking and has been prepared in response to specific asset class maintenance strategies, integrity inspections and reports, regulatory compliance driven equipment upgrades and Safety Management Studies outcomes in addition to any items that pose a threat to commercial operations.

A summary of the Five Year capital spending is detailed below by Asset Group.

Table 5 – Fy17 to Fy22 Capital Work Program by Asset Group

ID		Fy17	Fy18	Fy19	Fy20	Fy21
1	Pipeline	14,514,000	21,780,000	14,168,000	5,833,000	7,258,,000
2	Stations	895,000	1295,000	615,000	305,000	150,000
4	Operations / Facility	210,000	200,000	200,000	200,000	200,000
5	**Grand Total**	**15,619,000**	**23,275,000**	**14,983,000**	**6,338,000**	**7,608,000**

Commentary

The major expenses (>$1M) in the above 5 year SIB Capex breakdown are highlighted below (and further defined in this AMP):

- RBP Risk Mitigation Works , with bulk expenditure budgeted for FY17 and minor carryover continuing;
- Annual RBP Integrity Upgrade Program (between $4m-$5m per year), features as prioritised per year;
- RBP DN250 crack detection tool (EMAT) budgeted across two financial years FY19 and FY20 (subject to tool availability);
- Deleted - confidential;
- RBP DN250 standard intelligent pig inspection program in FY19;
- RBP DN400 standard intelligent pig inspection program ($1.8M) in FY21;

The above CAPEX budget includes all priority classified items (High, Medium and Low).

The CAPEX budget does not consider capital purchase in relation to vehicles and plant on the basis that RBP vehicles are continuing to be leased and additional plant is not currently required; tools necessary for the work program delivery are included.

The following table presents that same data as in Table 5 however it is represented by Discipline.

Table 6 – Fy17 to Fy21 Capital Work Program by Discipline

ID	Discipline	Fy17	Fy18	Fy19	Fy20	Fy21
1	Integrity	13,225,000	19,803,000	12,950,000	4,810,000	6,230,000
2	Cathodic Protection	629,000	642,000	648,000	648,000	648,000
3	Lands	210,000	215,000	220,000	225,000	230,000
4	Rotating	-	-	-	-	-
5	Electrical	310,000	620,000	150,000	225,000	150,000
6	Mechanical	735,000	1,145,000	815,000	180,000	100,000
7	Metering	-	-	-	50,000	50,000
8	Operations	210,000	200,000	200,000	200,000	200,000
9	Civil	300,000	650,000	-	-	-
	Grand Total	**15,619,000**	**23,275,000**	**14,983,000**	**6,338,000**	**7,608,000**

7.5 Five Year MEJ Funding

The following table details the Major Expense Job funding by discipline; further information in relation to the individual MEJ items can be found on Page 1 of Appendix A, following.

Table 7 – Fy17 to Fy22 Major Expense Funding by Discipline

ID		Fy17	Fy18	Fy19	Fy20	Fy21
1	Cathodic Protection	-	100,000	100,000	50,000	
2	Integrity	-	-	-	-	-
3	Lands / Operations	-	50,000	130,000		
	Grand Total		**150,000**	**230,000**	**50,000**	**-**

Commentary

1. Refer to Appendix 1 for further detail.

Appendix 1 – 5 Year Capital and MEJ Plan [confidential]

Asset	Asset Group	Function	PROJECT NAME		FY17	FY18	FY19	FY20	FY21	FY22
RBP	Pipeline	Integrity	RBP RISK MITIGATION - FEED and IMPLEMENTATION	SIB	$ 8,000,000	$ 1,600,000	$ 300,000	$ 300,000	$ 300,000	$ 300,000
RBP	Pipeline	Integrity	DN250 INTEGRITY UPGRADE PROGRAM	SIB	$ 4,900,000	$ 5,293,000	$ 5,970,000	$ 3,980,000	$ 3,680,000	$ 4,231,000
RBP	Pipeline	Cathodic Protection	RBP CP UPGRADE PROGRAM	SIB	$ 629,000	$ 642,000	$ 648,000	$ 648,000	$ 648,000	$ 648,000
QLD	Station	Mechanical	Portable Slug Catcher - DN400	SIB	$ 400,000					
RBP	Pipeline	Integrity	RBP METRO ILI - DN300	SIB	$ 220,000					$ 220,000
QLD	Facility	Operations	QLD OPERATIONS SIB FUNDING	SIB	$ 210,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000	$ 200,000
RBP	Pipeline	Lands	ANODE BED EASEMENTS PROGRAM	SIB	$ 210,000	$ 215,000	$ 220,000	$ 225,000	$ 230,000	$ 235,000
RBP	Station	Mechanical	RBP STATION UPGRADES - HAZOP & Other	SIB	$ 160,000	$ 305,000	$ 305,000	$ 100,000	$ 100,000	
RBP	Station	Electrical	RBP HA RECTIFICATION	SIB	$ 150,000	$ 50,000				$ 100,000
RBP	Pipeline	Electrical	RBP CP TELEMETRY UPGRADE	SIB	$ 150,000	$ 150,000	$ 150,000	$ 150,000	$ 150,000	
RBP	Station	Mechanical	RBP & PEAT ISOLATION PLAN UPGRADES	SIB	$ 100,000	$ 100,000	$ 100,000			
RBP	Station	Mechanical	SWANBANK ISOLATION VALVE	SIB	$ 50,000					

Asset	Asset Group	Function	PROJECT NAME		FY17	FY18	FY19	FY20	FY21	FY22
RBP	Station	Mechanical	RBP - TYPE B GAS COMPLIANCE UPGRADES	SIB	$ 25,000	$ 110,000	$ 110,000			
RBP	Pipeline	Integrity	RBP CE Lateral ILI - DN400	SIB			$ 10,000	$ 190,000		
RBP	Station	Electrical	GIBSON ISLAND E/I REVIEW FEED	SIB	$ 10,000					
RBP	Pipeline	Integrity	RBP LYTTON LATERAL ILI - DN200	SIB	$ 5,000	$ 140,000				
RBP	Station	Rotating	Turbine overhauls - Dalby	SIB						$ 1,300,000
RBP	Pipeline	Integrity	RBP SCCMP EMAT ILI - DN250	SIB		$ 1,800,000	$ 1,200,000			
RBP	Station	Mechanical	PEAT LATERAL LIQUIDS REMOVAL	SIB		$ 300,000				
RBP	Pipeline	Civil	TOOWOOMBA RANGE SLOPE MONITORING WORKS	SIB	$ 300,000	$ 650,000				
RBP	Pipeline	Electrical	RBP- AS4853 ELECTRICAL HAZARD UPGRADES	SIB		$ 120,000				
RBP	Station	Electrical	RBP STATION FIRE SUPRESSION UPGRADES - BELLBIRD PARK	SIB				$ 75,000		
RBP	Station	Electrical	TOOWOOMBA STATION HEATER INSTALLATION	SIB		$ 250,000				
RBP	Station	Metering	Gas Measurement Upgrade - including shades	SIB				$ 50,000	$ 50,000	

Asset	Asset Group	Function	PROJECT NAME		FY17	FY18	FY19	FY20	FY21	FY22
QLD	Station	Electrical	SIS demand/test tracking system	SIB		$ 50,000				
deleted - confidential										
RBP	Pipeline	Integrity	WATER EASEMENT EMERGENCY PREPAREDNESS - FEED	SIB		$ 10,000		$ 100,000	$ 100,000	
RBP	Pipeline	Integrity	RBP DN400 Supply Offtakes	SIB			$ 250,000		$ 100,000	
RBP	Station	Mechanical	SCOTIA / WOODROYD VENT EXTENSION	SIB		$ 30,000				
RBP	Station	Mechanical	Gibson Island Pressure Vessel platforms	SIB				$ 80,000		
RBP	Pipeline	Integrity	Condamine River Strain Excavation	SIB		$ 200,000				
RBP	Pipeline	Integrity	RBP MAINLINE ILI PROGRAM - DN250	SIB			$ 1,500,000			
RBP	Pipeline	Integrity	RBP LOOPING ILI - DN400	SIB					$ 1,800,000	
RBP	Pipeline	Integrity	RBP SCC EMAT ILI - DN300	SIB						$ 900,000
RBP	Pipeline	Integrity	RBP METRO LOOP ILI - DN400	SIB			$ 120,000			
RBP	Pipeline	Integrity	RBP METRO (ORIGINAL) ILI - DN200	SIB		$ 60,000				
RBP	Pipeline	Integrity	PEAT LATERAL ILI - DN250	SIB				$ 140,000		
RBP	Pipeline	Mechanical	RBP SCRAPER TRAP MODIFICATIONS	SIB		$ 200,000	$ 200,000			

Asset	Asset Group	Function	PROJECT NAME		FY17	FY18	FY19	FY20	FY21	FY22
RBP	Pipeline	Integrity	Laser Scanner for Feature Assessment	SIB					$ 150,000	
RBP	Station	Mechanical	RBP S20 Decommissioned Compressor Removal	SIB		$ 100,000	$ 100,000			
RBP	Pipeline	Integrity	PIPELINE EXCAVATION PROGRAM (unplanned)	SIB	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	
RBP	Pipeline	Cathodic Protection	CP INTERFERENCE TESTING AND MITIGATION	MEJ		$ 100,000	$ 100,000	$ 50,000		
RBP	Pipeline	Operations	DN250, DN300, DN200 Assessment of loss of cover and mitigation	MEJ		$ 50,000	$ 50,000			
RBP		Operations	ROW Erosion Repairs -	MEJ			$ 80,000			$ 80,000