

# GLNG Investor Visit

25-26 June 2014

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All references to dollars, cents or \$ in this document are to Australian currency, unless otherwise stated. All references to project completion percentages are on a value of work done basis, unless otherwise stated.

This presentation refers to estimates of petroleum reserves and contingent resources contained in Santos' Annual Reserves Statement released to the ASX on 21 February 2014 (Annual Reserves Statement). Santos confirms that it is not aware of any new information or data that materially affects the information included in the Annual Reserves Statement and that all the material assumptions and technical parameters underpinning the estimates in the Annual Reserves Statement continue to apply and have not materially changed.

The estimates of petroleum reserves and contingent resources contained in this presentation are as at 31 December 2013. Santos prepares its petroleum reserves and contingent resources estimates in accordance with the Petroleum Resources Management System (PRMS) sponsored by the Society of Petroleum Engineers (SPE). Unless otherwise stated, all references to petroleum reserves and contingent resources quantities in this presentation are Santos' net share. Reference points for Santos' petroleum reserves and contingent resources and production are defined points within Santos' operations where normal exploration and production business ceases, and quantities of produced product are measured under defined conditions prior to custody transfer. Fuel, flare and vent consumed to the reference points are excluded. Petroleum reserves and contingent resources are aggregated by arithmetic summation by category and as a result, proved reserves may be a very conservative estimate due to the portfolio effects of arithmetic summation. Petroleum reserves and contingent resources are typically prepared by deterministic methods with support from probabilistic methods. Conversion factors: 1PJ of sales gas and ethane equals 171,937 boe; 1 tonne of LPG equals 8.458 boe; 1 barrel of condensate equals 0.935 boe; 1 barrel of crude oil equals 1 boe.

## Project overview

## Integrated LNG project on track for first LNG in 2015



<sup>1</sup> Based on foreign exchange rates which are consistent with the assumptions used at FID (A\$/US\$ 0.87 average over 2011-15).

Location	Queensland, Australia
Project partners	Santos (30% and operator), PETRONAS, Total and KOGAS
Project scope	<ul style="list-style-type: none"><li>• Drilling ~800 CSG wells over 2011-15, in addition to existing pre-FID wellstock</li><li>• Existing and sanctioned gross upstream compression capacity 725 TJ/day, additional capacity under study</li><li>• Incremental gas supply and infrastructure projects</li><li>• 420 kilometre gas transmission pipeline</li><li>• 2 train LNG plant and associated infrastructure</li></ul>
LNG plant capacity	7.8 mtpa of LNG; 7.2 mtpa has been sold to PETRONAS and KOGAS
Gross capital cost estimate	US\$18.5 billion <sup>1</sup> from FID to the end of 2015 when the second train is expected to be ready for start-up
LNG train ramp-up	Train 1 first LNG expected in 2015; LNG production expected to ramp-up over 3-6 months Train 2 first LNG expected 6-9 months after train 1; LNG production expected to ramp-up over 2-3 years

## Safety performance

Over 68 million hours worked since FID, including 17 million hours worked to date in 2014

- › 2014 YTD lost time injury (LTI) frequency rate 0.35 per million hours worked
- › Recent milestones for the workforce include:
  - 7 million hours without an LTI achieved at the module yard in Batangas
  - 2 million hours without an LTI achieved on Curtis Island
  - 2 million hours without an LTI achieved on the gas transmission pipeline
  - 10 million hours without an LTI achieved on the upstream construction project
- › 100% safety critical maintenance achieved for upstream operations in 2014 YTD



Batangas module yard staff

## Project progress

## Strong construction progress across the integrated project in 2014

### Gas supply

- › Over 560 wells drilled since FID
  - Fairview average well capacity increased to 2.2 TJ/day
  - Roma wells online supporting well capacity of 0.5 TJ/day
- › Commissioning of the first upstream gas hub is underway
- › Santos portfolio & third party gas provides 410-570 TJ/day in 2016
- › Underground storage delivery rate 75 TJ/day

### Gas transmission pipeline

- › Marine crossing tunnel is complete
- › All of the 420-km pipeline is in the ground, hydrotested and de-watered
- › Interconnections with QCLNG pipeline complete

### LNG plant and port

- › All 82 Train 1 modules set
- › 11 of 29 Train 2 modules set
- › Jetty over 95% complete
- › Preparations for hydrostatic testing of first LNG tank underway

Fairview Hub 05



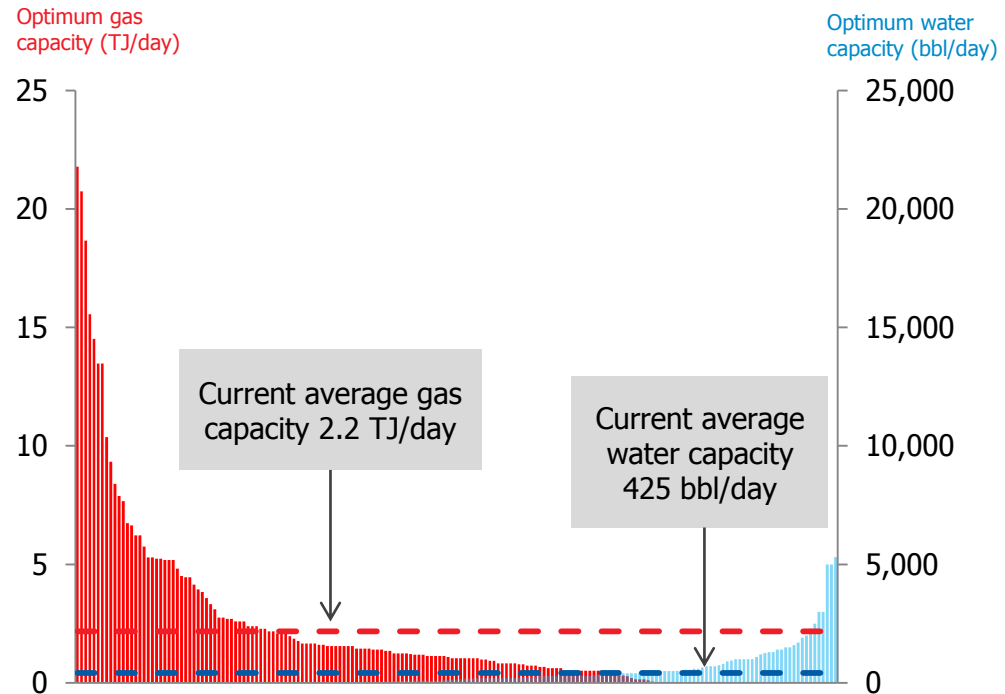
## Fairview well performance

- › Reservoir performance better than expected
- › Total gross field well capacity 400 TJ/day at end of May
- › Forecast gross field well capacity ~560 TJ/day by end of 2015
- › Recent capacity testing on FV-183 and FV-247 wells showed optimum gas capacities >20 TJ/day per well

Performance of Fairview wells continues to exceed expectations – average gas capacity of 2.2 TJ/day per well

### Fairview well performance as at 31 May 2014

183 wells connected

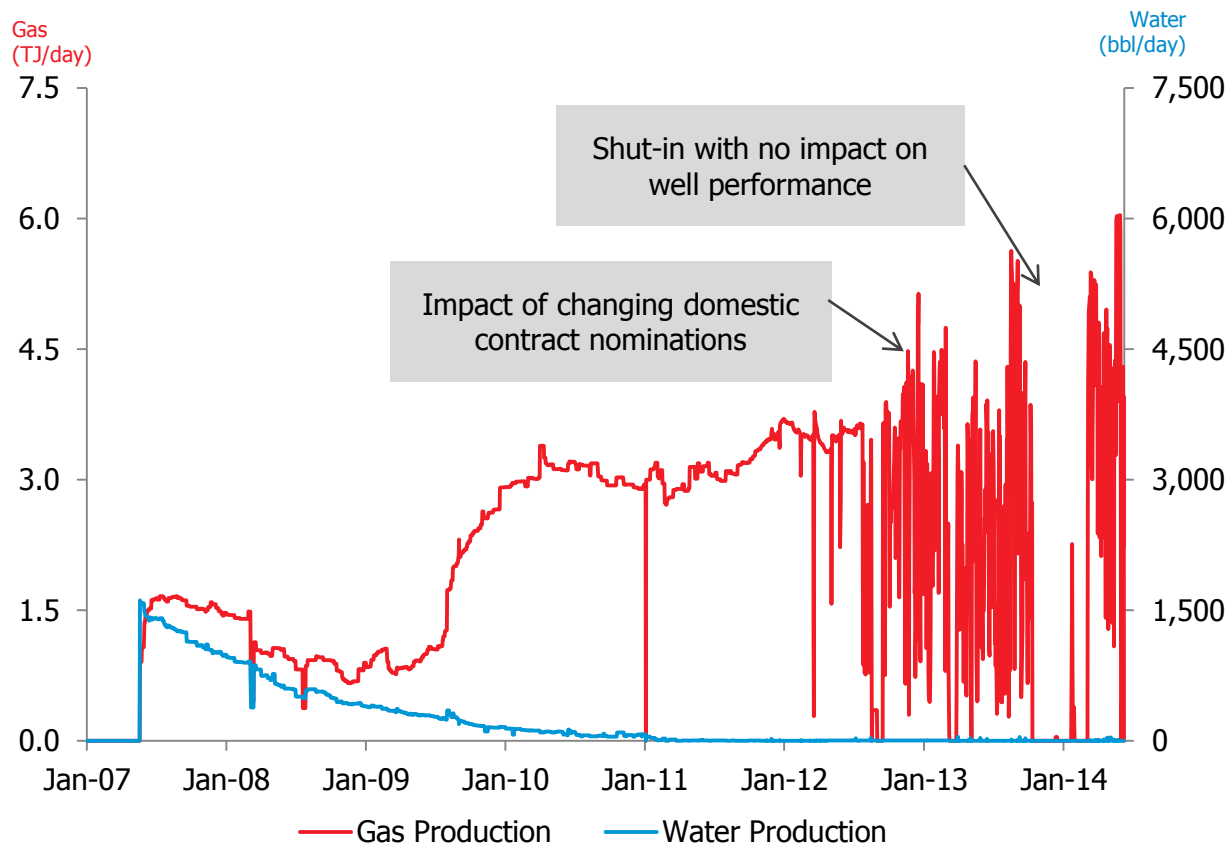


## Fairview field performance

Deliverability of existing wells continues to exceed expectations and well performance demonstrates high turn down ratios

- › Large number of free flow gas wells adds turn down capability
- › Minimal turn down effects on free flow gas well performance
- › Field water production rates lower than forecast

### Fairview 118 well - actual production



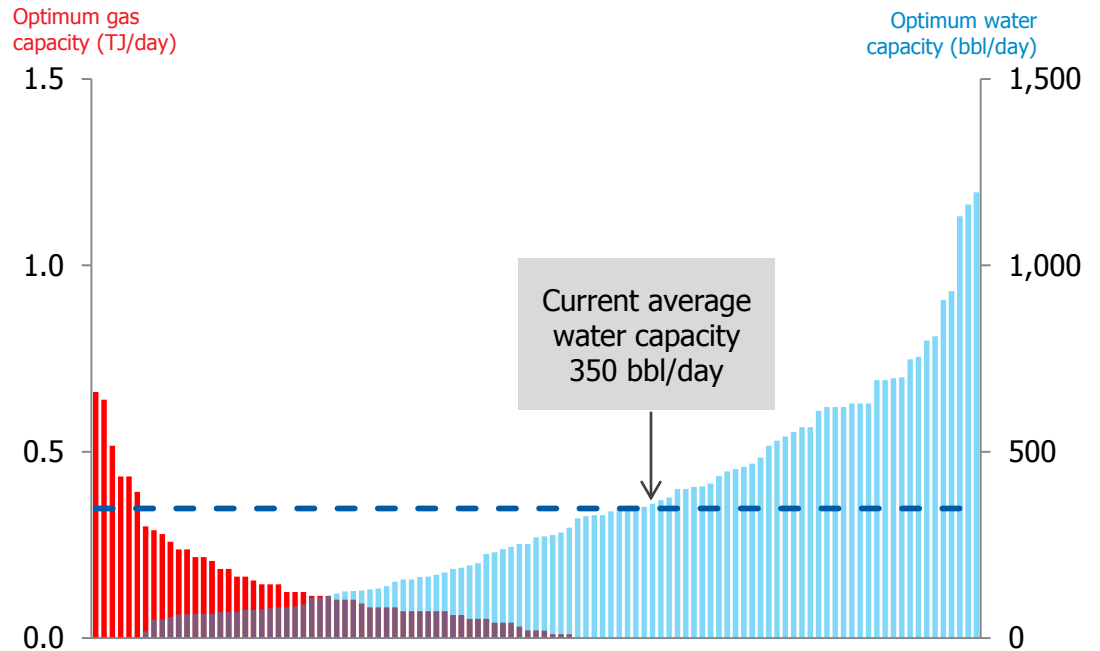


## Roma well performance

Roma wells online and dewatering, supporting individual well capacity of 0.5 TJ/day

- › 52 development wells online:
  - 22 development wells that are dewatering into the Roma Hub 2 facilities
  - 18 wells that are undergoing commissioning
  - 12 dewatering to local facilities prior to connection
- › Additional 23 pilot wells online to assess coal productivity in potential future development areas

Roma well performance as at 31 May 2014



## Drilling and completions

## Continuing to drive down well costs

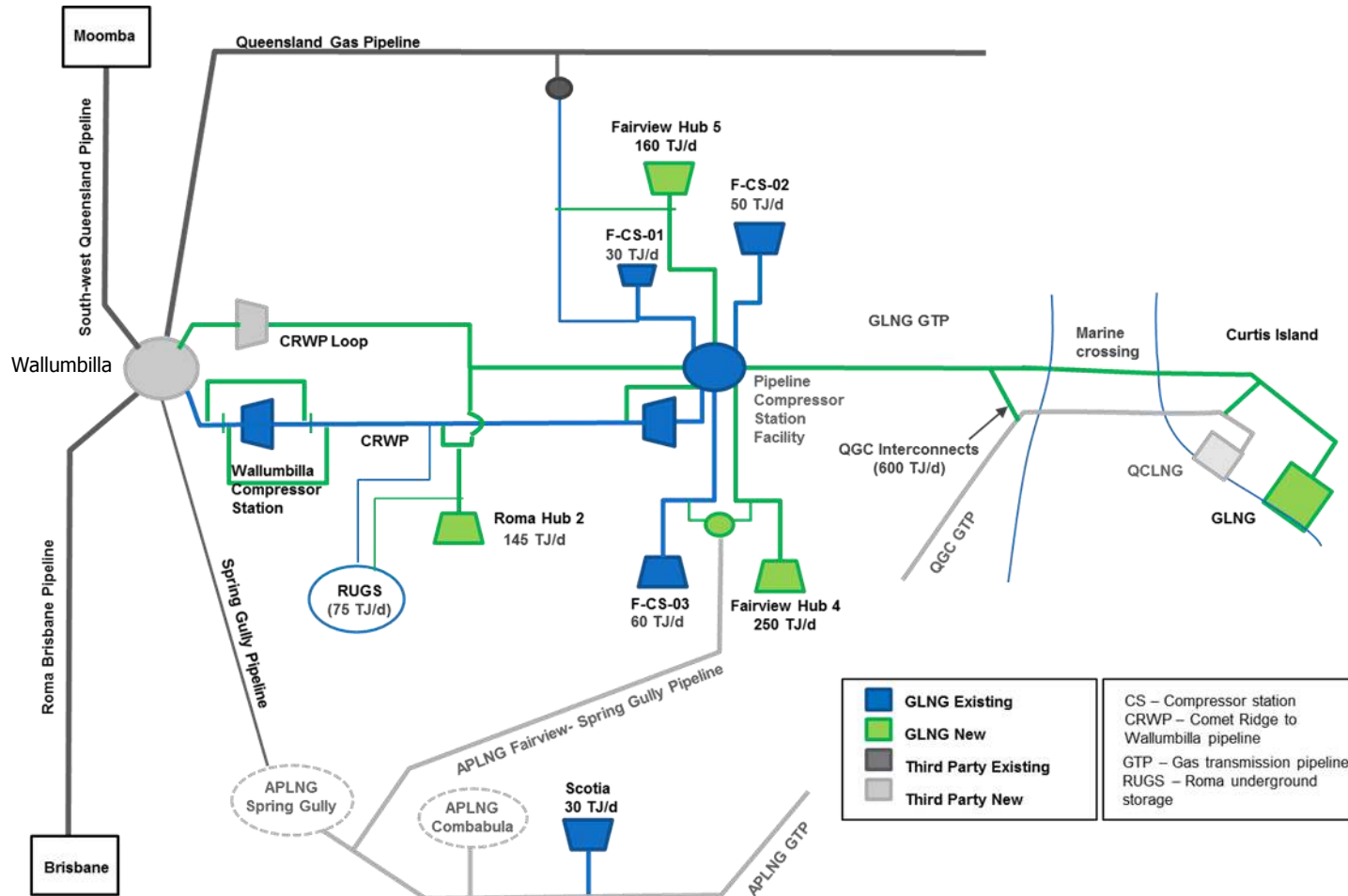
- › Over 560 wells drilled since FID
- › Over 30% reduction in drilling and completion costs per well since FID
  - Average 2013 D&C cost of \$1.35 million per development well (30% wells drilled in Fairview, 70% drilled in Roma)
- › Current fleet of 6 drilling rigs and 4 completion rigs
- › 2014 program focuses on Fairview field (80% Fairview, 20% Roma)
- › Expect to drill ~300 wells over 2014-15
- › Expect to drill 200-300 wells per annum over 2016-20 and ~200 wells per annum in 2021+



Saxon 186 rig in the Fairview field

# Upstream infrastructure

Integrated upstream development with connections to APLNG and QCLNG



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## Upstream construction

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## Hub construction is nearing completion

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### Fairview Hub 5

- › 160 TJ/day gross gas capacity
- › 4 ML/day water handling facilities
- › Commissioning is underway

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### Fairview Hub 4

- › 250 TJ/day gross gas capacity
- › 20 ML/day water handling facilities
- › Hub construction >98% complete and commissioning will commence in the coming weeks

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### Roma Hub 2

- › 145 TJ/day gross gas capacity
- › 10 ML/day water handling facilities
- › Hub construction >97% complete

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## Fairview Hub 5 160 TJ/day capacity

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Hub 5 has been handed over to the commissioning team, focus is on commissioning the GTAs, GTCs and nodal compressors

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Fairview Hub 5 – 160 TJ/day gross gas capacity and 4 ML/day water handling facilities



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## Fairview Hub 4 250 TJ/day capacity

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Hub 4 construction is >98% complete, with commissioning to commence in the coming weeks

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Fairview Hub 4 – 250 TJ/day gross gas capacity and 20 ML/day water handling facilities



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## Roma Hub 2 145 TJ/day capacity

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Hub 2 construction is >97% complete – focus on handover of sub-systems for commissioning

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Roma Hub 2– 145 TJ/day gross gas capacity and 10 ML/day water handling facilities



## Pipeline compressor station (PCS)

- › Connection point to the gas transmission pipeline to Gladstone
- › PCS is the collection point for all of GLNG's upstream gas infrastructure, including:
  - Existing hubs (CS1, CS2, CS3)
  - New hubs (FV04, FV05, RM02)
  - CRW Pipeline and Loop
- › Mechanical completion achieved mid-May 2014
- › Commissioning is underway

Construction of the pipeline compressor station is complete and commissioning has commenced



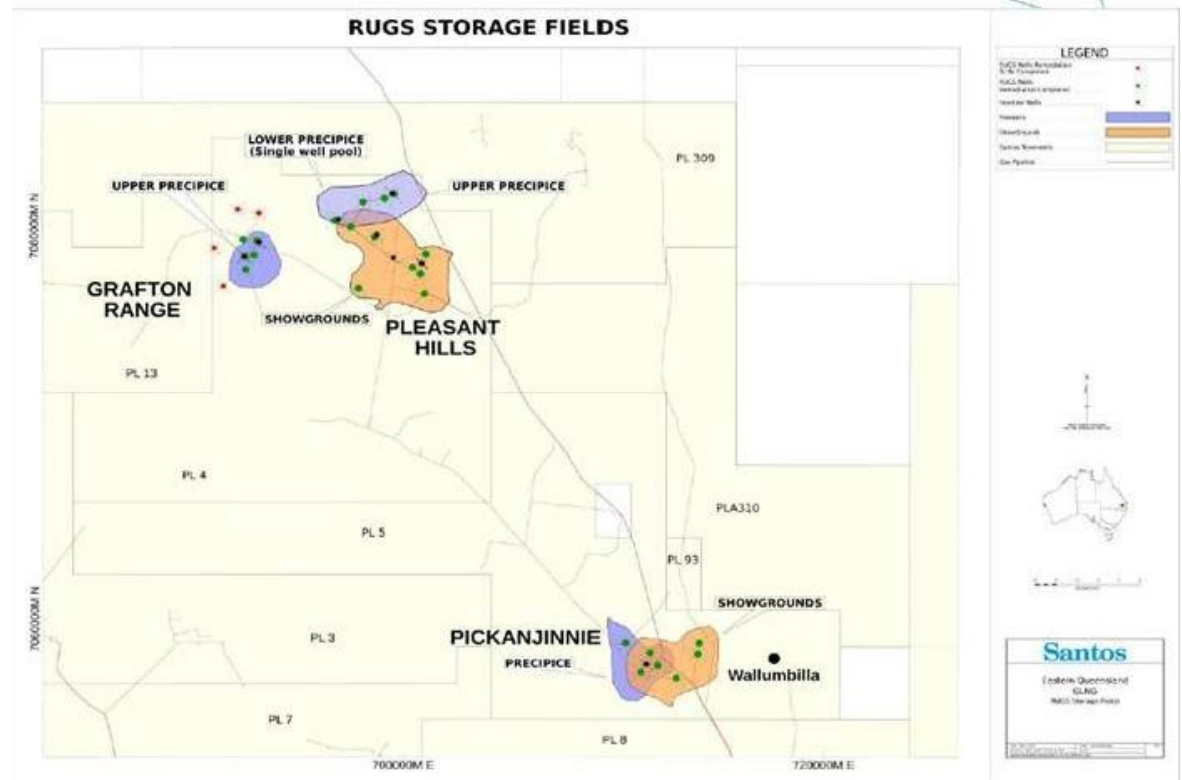
PCS, Fairview



## Roma underground storage (RUGS)

- › Gas storage in three depleted conventional Roma gas fields: Pleasant Hills, Grafton Range and Pickanjinie
- › 7 injection wells on-line
- › Injection/withdrawal rate 75 TJ/day
- › Capacity >50 PJ
- › Key infrastructure providing operational flexibility

RUGS provides significant gas storage capacity adjacent to the Wallumbilla gas hub



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## Incremental gas supply and infrastructure projects

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## Investing in incremental field development and infrastructure

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- › In addition to the project scope approved at FID, the following projects have been sanctioned:
  - Fairview Eastern Flank
  - Fairview Infill
  - Roma West Phase 2A
  - CRWP Loop
  - Upstream electrification
  - Marine crossing tunnel
  - QGC pipeline interconnects
  
- › Optimisation studies ongoing for investment in additional upstream compression and gas storage capacity
  - In detailed design on incremental brownfield compression capacity additions of up to 150 TJ/day
  - RUGS expansion studies

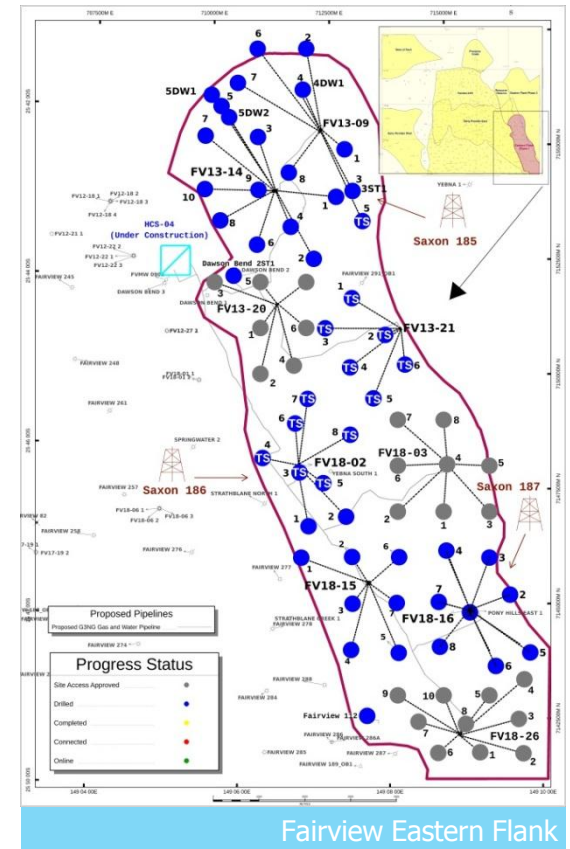


Drilling the FV-18-02-8 well, Fairview Eastern Flank

## Fairview Eastern Flank

Brownfield development that utilises the existing capacity at Fairview Hub 4

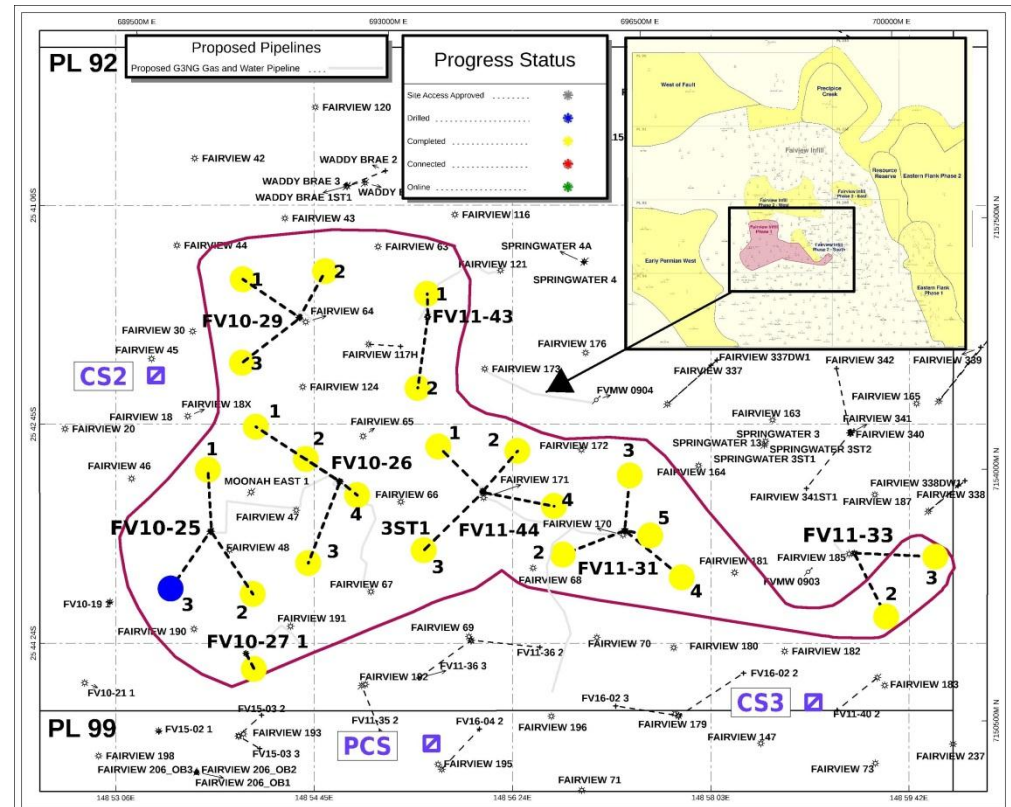
- Sanctioned in November 2013
- Comprises the development of 2P reserves in the Bandanna coals along the eastern flank of the Fairview field
- Development includes:
  - Drilling and completion of 71 new wells and completion of three existing wells
  - Surface facilities – well pad equipment, gathering lines and associated power lines
- Current project status:
  - 30 wells have been drilled to total depth
  - Additional 15 wells have been topset
  - Initial flow tests showing good flowrates



## Fairview Infill

Drilling of infill wells in the core Fairview area, which will result in 1-kilometre well spacing across the current development area

- Sanctioned in December 2013
- Brownfield development - will use the existing compression and water management facilities
- Development includes:
  - Drilling and connection of 23 wells
  - Surface facilities – well pad equipment, gathering lines and associated power lines
- Current status:
  - All wells have been drilled
  - Flow tests results within expectation
  - Majority of the wells are free flow

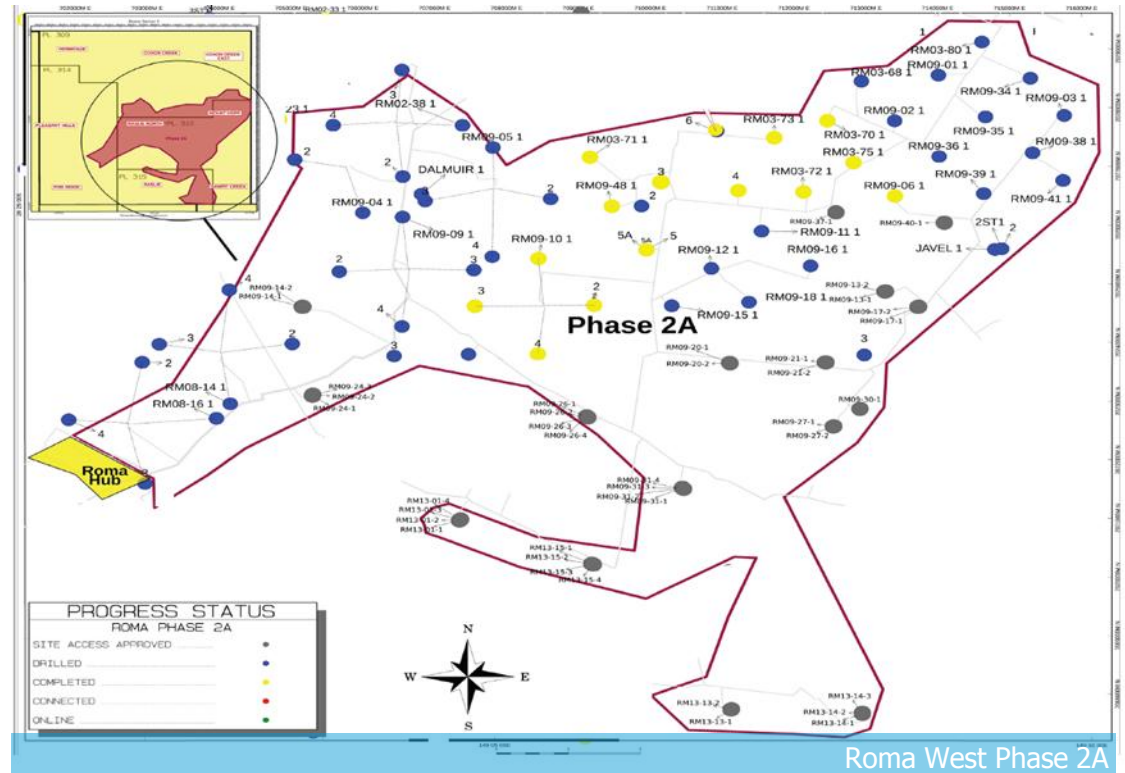


Fairview Infill

## Roma West Phase 2A

## Incremental Roma field development

- › Sanctioned in June 2014
- › Development includes:
  - Drilling, completion and connection of 88 wells
  - Completion and connection of 6 pilot wells
  - Approximately 100 kilometres of gas gathering, water gathering, fibre optics and power distribution
  - Tie-ins to the Roma Hub 2 compression facility and water treatment plant
  - Installation of two additional nodal compressors at existing Roma Hub 2
- › Current status
  - 44 wells have been drilled



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## CRWP Loop

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Construction of 120-kilometre CRWP Loop more than 40% complete

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- › Sanctioned in April 2013
- › Comet Ridge to Wallumbilla pipeline (CRWP) looping will increase the capacity of the existing pipeline to 910 TJ/day
- › Follows the existing CRWP easement
- › Construction progress:
  - Clear & grade 80% complete
  - Stringing 60% complete
  - Mainline welding 40% complete



CRWP stringing, April 2014

## Capital expenditure and opex guidance

US\$18.5 billion<sup>1</sup> capex from FID to the end of 2015  
 2016-20 average capex estimate A\$1 billion pa

### Capital expenditure estimate

FID to end of 2015 US\$18.5 billion<sup>1</sup>

2016-2020 ~A\$1 billion average per annum

Post 2020 ~A\$0.5 billion average per annum

### Opex average cost estimate

Upstream field ~A\$1.25/GJ  
(excludes electricity and carbon)

Downstream ~A\$150 million per annum  
(pipeline, plant and port)

- › Vast majority of 2016-20 expenditure is the upstream, and includes:
  - Drilling and completion of new wells (~200–300 per annum)
  - Connections of new wells, including wellpads, gas gathering lines, water pipelines, and power/communications infrastructure
  - Additional compression, water treatment facilities and ponds, trunklines, transmission lines and roads
  - Capitalised cost of staff working on upstream capex projects and wages associated with engineering, procurement and construction of upstream capex projects
  - Exploration and appraisal
  - Domestic gas stay-in-business capex
- › Includes maintenance capex for the LNG plant and gas transmission pipeline

<sup>1</sup> Based on foreign exchange rates which are consistent with the assumptions used at FID (A\$/US\$ 0.87 average over 2011-15).

## Third party gas supply

- › Attractive oil-linked gross margins
- › Provides operational flexibility in LNG train ramp-up and operation

## Third party gas generates significant value for the project

Supplier	Quantity	TJ/day	Starts	Term	Delivery point	Price basis
Santos portfolio 'Horizon'	750 PJ	140	2015	15 years	Wallumbilla	Oil-linked
Origin	365 PJ	100	2015	10 years	Wallumbilla	Oil-linked
Origin	194 PJ <sup>1</sup>	50-100 <sup>1</sup>	2016	5 years	Wallumbilla	Oil-linked
Other suppliers	85 PJ <sup>2</sup>	10-15 60-100	2015 2016	7 years 21 months	Wallumbilla	Oil-linked
Meridian JV	445 PJ <sup>3</sup>	20-65	2015	20 years	GLNG GTP	Oil-linked <sup>4</sup>
Combabula/ Spring Gully	355 PJ <sup>5</sup>	30-50	2015	30 years	Fairview	Oil-linked

<sup>1</sup> 100 PJ firm volume over 5 years. Origin has the option to supply additional volumes of up to 94 PJ during the same period.

<sup>2</sup> 60PJ of this supply is subject to finalisation and execution of agreements, which is expected by mid-2014.

<sup>3</sup> Source: WestSide Corporation Target Statement of 16 May 2014. Excludes additional gas production by the Meridian Joint Venture beyond 65 TJ/day. Volumes subject to Meridian field production performance and implementation of expansion plans.

<sup>4</sup> Oil-linked from 2016.

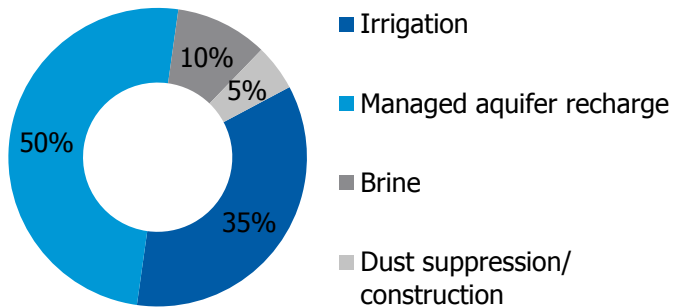
<sup>5</sup> Santos share 2P reserves in the APLNG-operated Combabula, Spring Gully and Ramyard fields at the end of 2013.



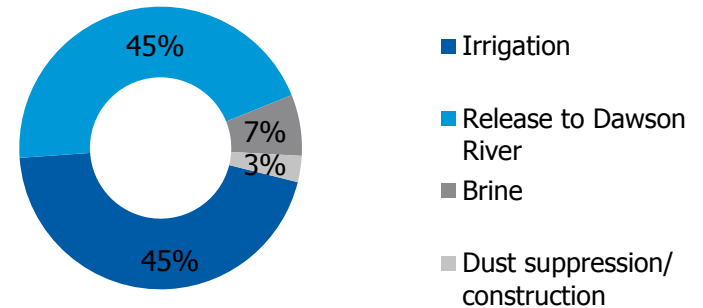
## Produced water

Our aim is to maximise re-use of produced water

### Uses of Roma produced water



### Uses of Fairview produced water



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## Economic benefits and community investments

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We strive to be a valued and respected member of the local communities which host our activities

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- › \$8.9 billion worth of work to businesses across Australia, including \$5.1 billion to Queensland businesses
- › A further \$50 million invested into community initiatives and sponsorships across Queensland, including:
  - Gladstone community housing support and airport
  - In the Maranoa for Roma Airport upgrade, improvements to community and allied health services, and housing support
  - Gladstone Hospital upgrade and midwifery program, and an industry-funded Aero Medical Evacuation and retrieval service in Gladstone
  - Weed and pest management across regional Queensland
  - Roma and Injune road upgrades



# Gas transmission pipeline



Pipeline push through the marine crossing tunnel



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## Gas Transmission Pipeline

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Hydrotesting and de-watering complete, final drying in progress

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- › 42 inch diameter  
420-kilometre pipeline
- › Strong progress as pipeline draws to completion:
  - All of the 420-kilometre pipeline is in the ground, hydrotested and de-watered
  - Marine crossing tunnel is complete
  - Pre-commissioning activities are substantially complete



Aerial view of the reinstated pipeline route in the Arcadia Valley

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## Interconnect with QGC pipeline

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The Mt Larcom interconnect has been completed and pre-commissioned, and construction is complete on the Curtis Island interconnect

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- › Allows for one train's volume of gas to flow from one project to the other, enabling projects to buy, sell or swap gas
- › Links both pipelines on the mainland and Curtis Island



Mt Larcom interconnect



Curtis Island interconnect

## Pipeline commissioning and operations

- › Commissioning team in place
- › Operations
  - Day-to-day control from Brisbane Operations Centre
  - Team in place who will participate in the commissioning activities
  - Integrated with existing Operations teams in the field

Commissioning of the pipeline is planned to commence in Q3 2014



Cable termination at KP52

# LNG plant and port

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Overhead view of GLNG LNG plant, 30 May 2014



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## Curtis Island workforce

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- › Approximately 3,400 people currently working on the GLNG plant and port
- › GLNG camp accommodation for 1,680 people on Curtis Island
- › Operational workforce of 160 required to run the LNG plant and port

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Focused on construction completion

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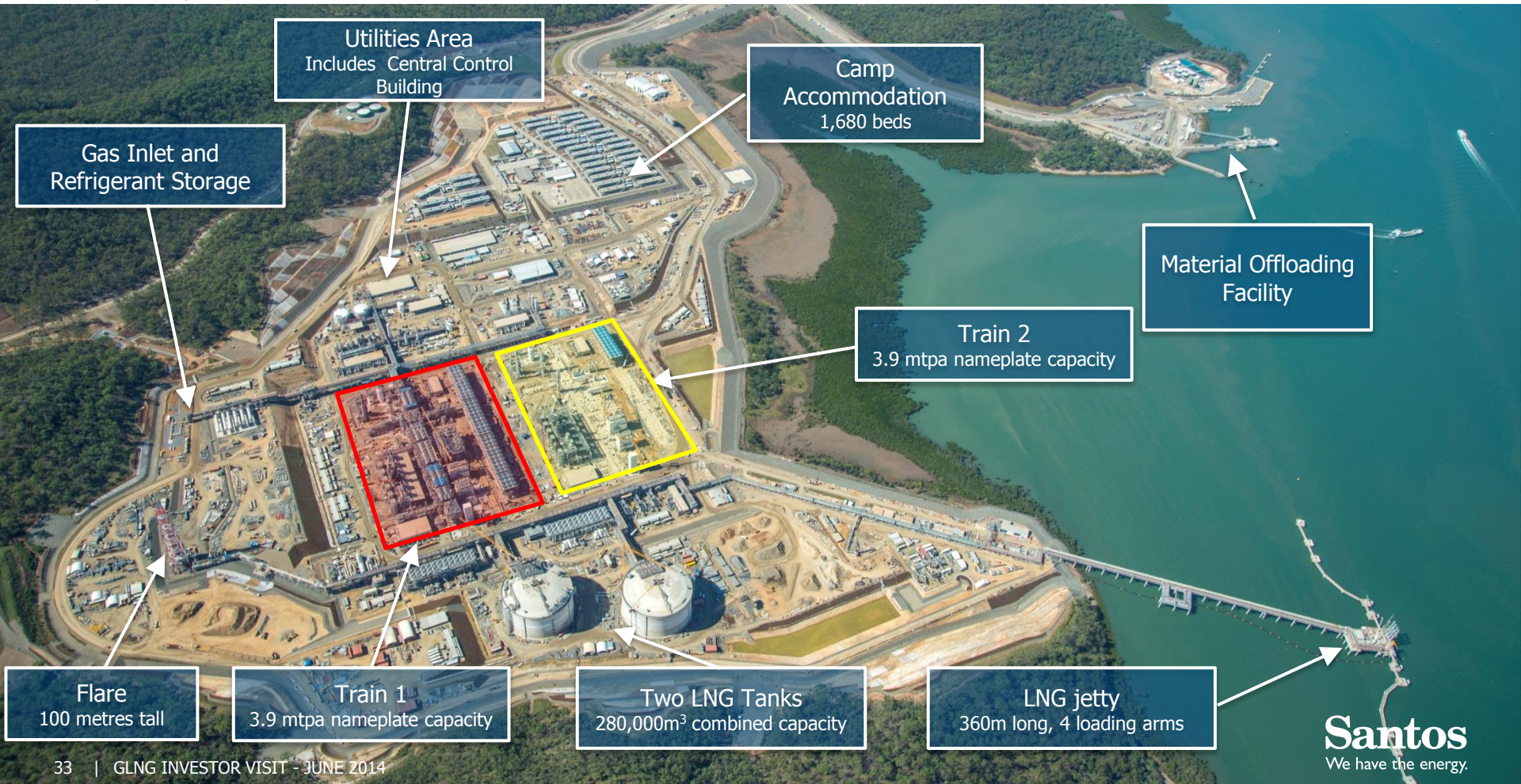
GLNG plant, May 2014



# GLNG plant site, Curtis Island

Two-train LNG plant with a nameplate capacity of 7.8 mtpa

GLNG plant site, May 2014



Gas Inlet and Refrigerant Storage

Utilities Area  
Includes Central Control Building

Camp Accommodation  
1,680 beds

Material Offloading Facility

Train 2  
3.9 mtpa nameplate capacity

Train 1  
3.9 mtpa nameplate capacity

Two LNG Tanks  
280,000m<sup>3</sup> combined capacity

LNG jetty  
360m long, 4 loading arms

Flare  
100 metres tall



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## LNG Train 1

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All 82 Train 1 modules set, work continues on cable pulling and piping hook-up

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LNG Train 1, May 2014



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## LNG Train 2

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11 of 29 Train 2 modules set, 7 modules in transit to site and 11 under assembly in Batangas

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LNG Train 2, May 2014



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## Outside Battery Limits Utilities Area

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Train 1 utilities area construction substantially complete and Train 2 utilities well underway

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OSBL Utilities Area, May 2014



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## LNG tanks

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LNG tanks progressing well – hydrostatic testing of first tank planned for early July

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LNG Tank B (foreground) and Tank A (background) with combined capacity of 280,000 m<sup>3</sup>, May 2014



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## LNG loading jetty

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Over 95% complete with the installation of quick release mooring hooks, capstans, fenders, vessel access gangway tower and loading arms completed

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LNG jetty, 360 metres long and suitable for ships with capacity up to 220,000m<sup>3</sup>, May 2014



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## Commissioning and operations

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- › Integrated Bechtel/GLNG commissioning and start-up team mobilising on site
- › LNG plant commissioning team includes GLNG operators
- › Experienced GLNG partner secondees working in key commissioning and start-up coordination roles
- › Downstream Operations team recruited with training underway

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Teams recruited and commissioning plans in place

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## GLNG

Significant milestones achieved over last 12 months;  
GLNG remains on track for first LNG in 2015

Milestone		Date
Marine crossing tunnelling commenced	✓	April 2013
First LNG tank roof raise completed	✓	June 2013
Second LNG tank roof raise completed	✓	September 2013
Dredging complete	✓	September 2013
Hydrotesting of pipeline commenced	✓	October 2013
Marine crossing tunnelling completed	✓	February 2014
Last Train 1 module set	✓	June 2014
First LNG tank hydrotest		July 2014
Pipeline construction complete		July 2014
First commissioning gas to LNG plant		Q4 2014
First LNG Train 1		2015



# Reference slides

Voyage 24, carrying four modules, leaving Batangas for Curtis Island. The module yard team has now despatched 18 of 29 Train 2 modules and 100 of 111 modules overall.

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Curtis Island, 31 May 2014

APLNG

QCLNG

GLNG

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## GLNG capex summary

	2013 capex	FID to Dec 2013 capex	Capex estimate from FID until the end of 2015	
	A\$ <sup>1</sup>	A\$ <sup>1</sup>	US\$ <sup>2</sup>	A\$ <sup>3</sup>
<b>\$billion</b>				
LNG project capex (100%)	5.7	13.7	18.5	20.7
Santos 30% share	1.7	4.1	5.6	6.2
<b>Non-LNG project capex (Santos 30% share)</b>				
Domestic stay in business	0.04	0.10		
Exploration & appraisal	0.07	0.17		
Capitalised stripping costs	<u>0.01</u>	<u>0.02</u>		
	0.12	0.29		
<b>Santos-only costs (Santos 100%)</b>				
Santos corporate costs	0.02	0.05		
Capitalised interest	<u>0.13</u>	<u>0.29</u>		
	0.15	0.34		
<b>Capitalised restoration (non-cash)</b>	0.03	0.09		
<b>Total Santos GLNG segment capex</b>	<b>2.0</b>	<b>4.8</b>		

SIB capex for GLNG's domestic operations

Appraisal & pre-development activities

Capitalised de-watering costs

Governance, finance, head office

Capitalised borrowing costs

Non-cash, accounting entry only

1 Actual realised FX.

2 FID average exchange rate assumptions (A\$/US\$ 0.87 and US\$/€0.76) over 2011-2015.

3 Average realised FX rates for 2011-2013 (A\$/US\$1.01 and US\$/€0.75) and assumes average rates of A\$/US\$0.87 and US\$/€0.80 over 2014-15.

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## Contact information

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### Head Office Adelaide

Ground Floor, Santos Centre  
60 Flinders Street  
Adelaide, South Australia 5000  
GPO Box 2455  
Adelaide, South Australia 5001  
Telephone: +61 8 8116 5000

### Useful email contacts

Share register enquiries:  
[web.queries@computershare.com.au](mailto:web.queries@computershare.com.au)

Investor enquiries:  
[investor.relations@santos.com](mailto:investor.relations@santos.com)

Website:  
[www.santos.com](http://www.santos.com)

### Andrew Nairn

Group Executive Investor Relations  
Direct: + 61 8 8116 5314  
Email: [andrew.nairn@santos.com](mailto:andrew.nairn@santos.com)

### Andrew Hay

Manager Investor Relations  
Direct: + 61 8 8116 7722  
Email: [andrew.hay3@santos.com](mailto:andrew.hay3@santos.com)

### Nicole Walker

Investor Relations Manager  
Direct: + 61 8 8116 5302  
Email: [nicole.walker@santos.com](mailto:nicole.walker@santos.com)