

Information Sheet #1

Marine seismic surveys in
the Joseph Bonaparte Gulf,
offshore Northern Australia



Overview

In 2017, Santos is planning to undertake two three dimensional (3D) marine seismic surveys, one after the other, in Commonwealth waters of the Joseph Bonaparte Gulf, northern Australia. We began talking about these surveys in 2015, with the goal of doing them in 2016, but our plans were delayed. We are now aiming to undertake them in 2017.

The first survey, called Fishburn, is proposed for exploration permit WA-459-P, which is held exclusively by Santos. The second survey, called

Bethany, is proposed for exploration permit NT/P85, which is a joint venture between Santos and Origin. Details specific to the Fishburn and Bethany surveys can be found at the back of this Information Sheet.

Santos, as operator of both permits, is required to undertake the surveys by the Commonwealth Government, pursuant to the Offshore Petroleum and Greenhouse Gas Storage Act 2006 and associated laws and regulations.

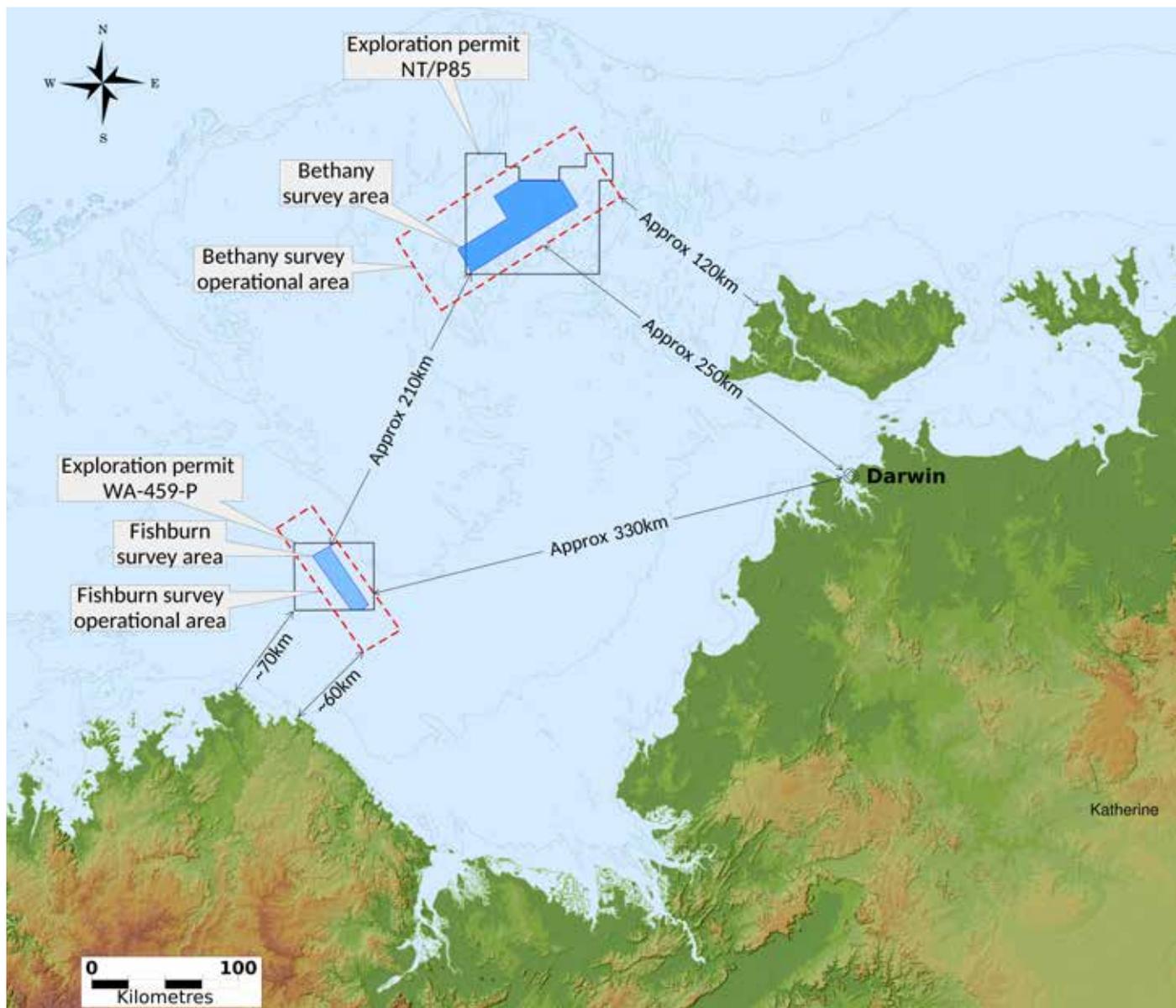
The aim of the surveys is to get an understanding of the subsurface geology

to determine the potential for natural gas in the respective permit areas.

The purpose of this Information Sheet is to let you know what we are proposing to do, and to find out if one or both of the surveys are of interest to you, and how we can undertake the surveys with the minimum impact on your interests and activities.

We are also seeking your advice on whether you wish to continue receiving information from us relevant to the proposed surveys, and if so, how you would like to receive that information in the future.

Figure 1: Location of the proposed Fishburn and Bethany survey areas in the Joseph Bonaparte Gulf



The survey process

The proposed Fishburn and Bethany surveys will be conventional 3D surveys employing technical methods and procedures commonly used in Australian waters. No unique or unusual equipment or operations are proposed.

A purpose-built survey vessel will be used and will be approximately 90 metres in length, 20 m wide and will carry up to 70 people. While the specific vessel for the proposed Fishburn and Bethany surveys has yet to be determined, the picture at Figure 2 is representative of the type of vessel that will be used.



Figure 2: Polarcus Asima seismic survey vessel

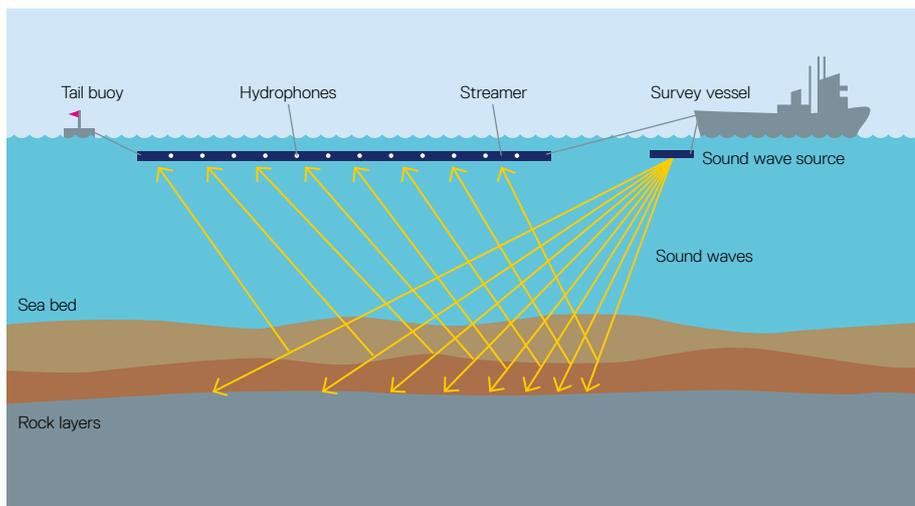


Figure 3: Diagram of the sound wave release and reflection process. Image is not to scale.

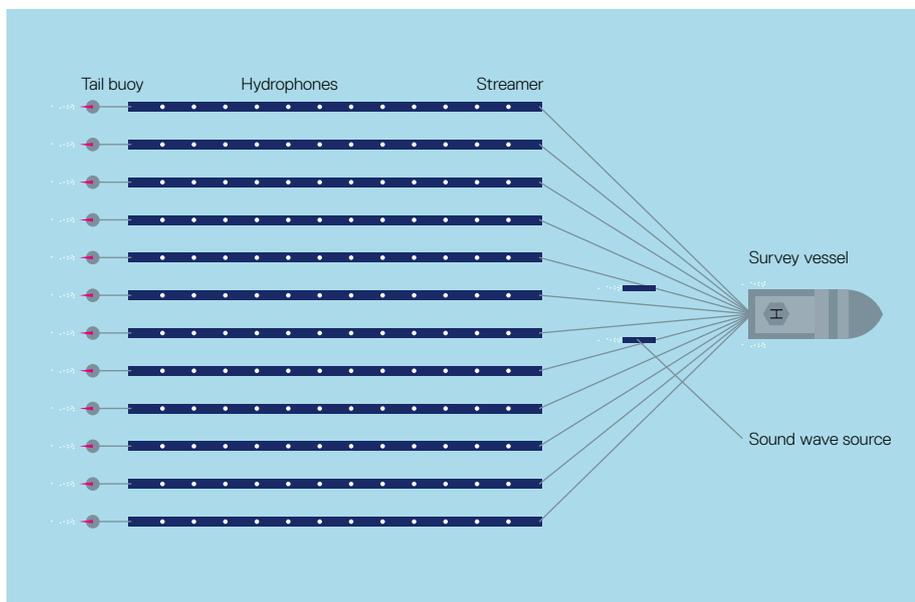


Figure 4: Diagram of the seismic survey layout. Image is not to scale

The survey vessel will travel along a series of pre-determined lines within the survey area at a speed of approximately 4.5 to 5 knots, towing cables (known as streamers) which contain microphones (known as hydrophones). As the vessel travels along the lines, sound waves (every 8 seconds) will be directed down through the water and into the geology below the seabed. The sound that reflects back is measured by the hydrophones and is later processed to provide information about the structure and composition of geological formations below the seabed.

The survey vessel will tow 12 streamers, at a length of 6 km, to a depth of approximately 15 m. The distance between each streamer is about 100 m. The survey will take place during the day and night.

We expect two vessels to be on site – the seismic vessel and a support vessel – for the duration of the proposed surveys. The support vessel will be near the seismic vessel at all times, unless visiting Darwin Port for supplies or a crew change. The support vessel is provided by the seismic contractor as it is specialised in working with seismic vessels.

While the support vessel for the proposed Fishburn and Bethany surveys has yet to be determined, the picture at Figure 5 is representative of the type of vessel that will be used.

Environmental approval

Petroleum activities (including seismic surveys) in Commonwealth waters are regulated by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), a Commonwealth statutory authority.

Before we can undertake the proposed surveys, our plan for managing the environment (the Environment Plan) must be accepted by NOPSEMA in accordance with the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations (2009).

The Environment Plan will describe the environment in which the proposed surveys will operate as well as detailing the potential environment impacts and risks posed by the surveys and how we will undertake the surveys in a way that avoids, minimises or manages these impacts and risks.

Consultation

Before we can submit an Environment Plan for acceptance by NOPSEMA, we must have consulted with 'relevant persons,' a description defined in the regulations as organisations or people whose functions, interests and activities may be affected by the proposed surveys.

This Information Sheet is designed to inform relevant persons about the proposed surveys so they can advise us how they might be affected by them.

All consultation will be recorded and provided in the Environment Plan submitted to NOPSEMA as required by the regulations.

A diagram showing the consultation process leading up to submission of the Environment Plan is attached to this Information Sheet.



Figure 5: Crest Voyager support vessel

Fishburn Survey

Location

The Fishburn survey will be undertaken in the Commonwealth waters of the Joseph Bonaparte Gulf, approximately 330 km west-south-west from Darwin and approximately 60 km from the closest point to land at Cape Rulhieres in the Kimberley region, Western Australia.

Figure 6 shows the:

- + *WA-459-P permit area*, which is approximately 2,494 km².
- + *Survey area* – this is the area in which the survey vessel will travel along pre-determined lines, towing the streamers and releasing sound waves. This covers an area of approximately 600 km² and the coordinates for this area are in Table 1.
- + *Survey operational area* – this is outside the survey area and is where activities like set-up, testing of equipment and vessel turn-arounds (to undertake the next line) take place.

This covers an area of approximately 3,150 km², and the coordinates for this area are in Table 2.

The water depth of the survey and operational areas ranges from 50 m to 100 m.

Timing

Preliminary discussions with some commercial fishers have indicated that a survey in WA-459-P will have least impact between 15 June to 1 August, and 1 December to 1 April. Accordingly, we are proposing to undertake this survey from mid-June 2017. However, there is the risk that early or late completion of the preceding survey may result in the seismic vessel arriving earlier or later than planned.

How long

The vessel set-up time, including equipment deployment, is typically two days. The survey is expected to take between 14 to 21 days.

Table 1

Fishburn survey area coordinates

Longitude	Latitude
127 26 50.65E	12 54 41.25S
127 31 37.65E	12 49 22.97S
127 43 30.60E	13 18 13.55S
127 48 16.03E	13 12 53.01S

Coord Ref System: GDA94
Format: Deg Min Sec [E,S]

Table 2

Fishburn survey operational area coordinates

Longitude	Latitude
127 13 36.30E	12 44 17.11S
127 26 50.50E	12 36 07.96S
127 45 53.78E	13 30 37.06S
127 59 55.90E	13 22 34.15S

Coord Ref System: GDA94
Format: Deg Min Sec [E,S]

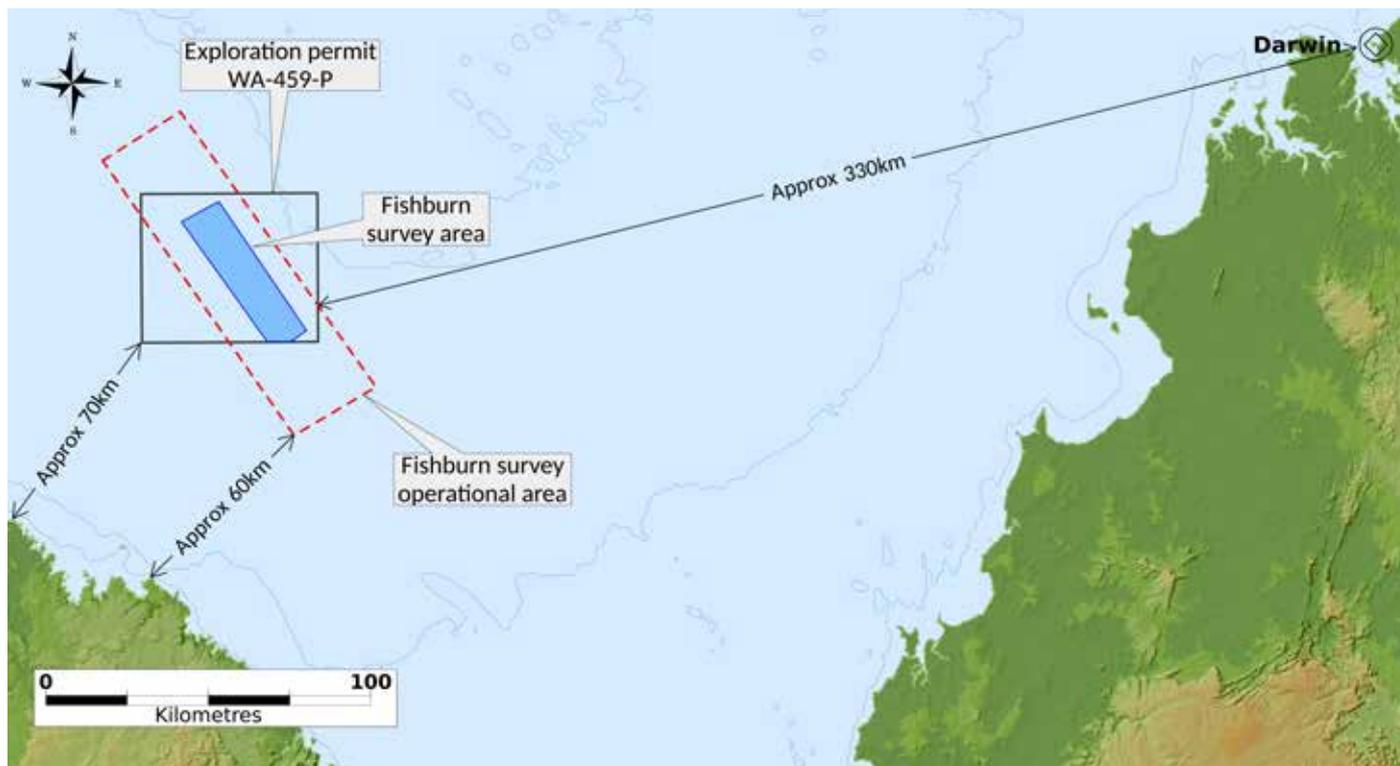


Figure 6: Fishburn seismic survey area and survey operational area

Bethany Survey

Location

The Bethany survey will be undertaken in the Commonwealth waters of the Joseph Bonaparte Gulf, approximately 255 km north-west of Darwin and 120 km west-north-west of Melville Island, the closest point to land.

Figure 7 shows the:

- + *NT/P85 permit area*, which is approximately 6,956 km².
- + *Survey area* – this is the area in which the survey vessel will travel along pre-determined lines, towing the streamers and releasing sound waves. This covers an area of approximately 2,200 km² and the coordinates for this area are in Table 3.
- + *Survey operational area* – this is outside the survey area and is where activities like set-up, testing of equipment and vessel turn-arounds (to undertake the next line) take place. This covers an area of

approximately 8,210 km², and the coordinates for this area are in Table 4.

The water depth of the survey and operational areas ranges from 40 m to 100 m.

Timing

Preliminary discussions with some commercial fishers have indicated that a survey in NT/P85 will have least impact between June and August. Accordingly, we are proposing to undertake this survey immediately after the Fishburn survey in early July 2017. However, there is the risk that early or late completion of preceding surveys, including the Fishburn survey, may result in the seismic vessel arriving earlier or later than planned.

How long

The vessel set-up time, including equipment deployment, is typically two days. The survey is expected to take between 30 to 40 days.

Table 3

Bethany survey area coordinates

Longitude	Latitude
128 27 06.02E	11 09 15.41S
128 22 05.69E	11 00 37.39S
128 40 39.95E	10 49 09.19S
128 35 35.13E	10 40 52.93S
128 45 11.21E	10 34 55.62S
129 01 07.21E	10 34 56.87S

129 07 04.01E 10 44 38.04S

Coord Ref System: GDA94

Format: Deg Min Sec [E,S]

Table 4

Bethany survey operational area coordinates

Longitude	Latitude
129 05 42.85E	10 15 17.83S
129 23 01.69E	10 41 07.65S
127 59 12.17E	10 56 44.77S
128 15 48.07E	11 23 15.75S

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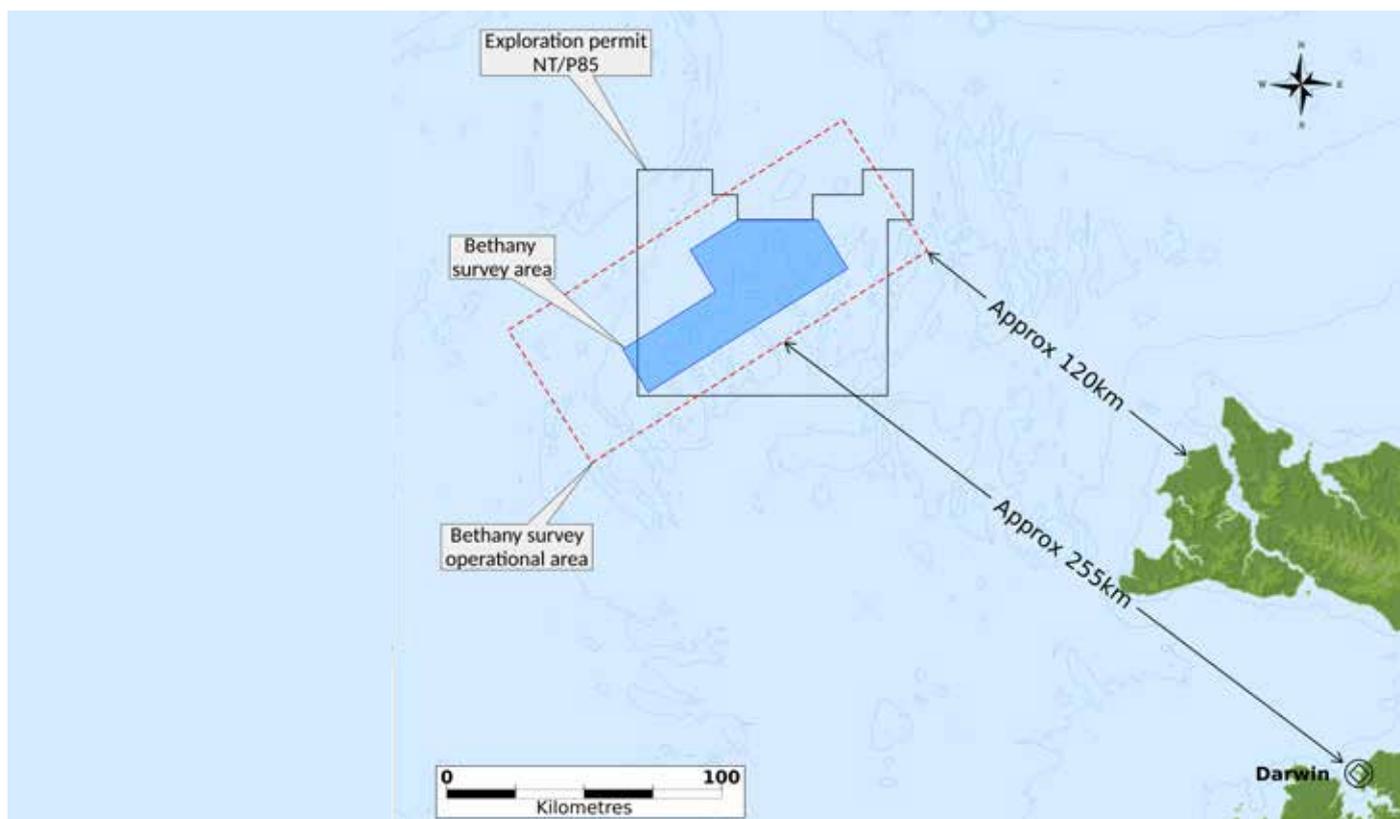


Figure 7: Bethany seismic survey area and survey operational area

Stakeholder consultation prior to surveys

Stage	Timing	Santos	Information	Stakeholder
Early Notification	2015/2016	Identified potentially affected stakeholders via: <ul style="list-style-type: none"> + Existing relationship + Peak bodies + Govt departments 	Provided potentially affected stakeholders via email and meetings: <ul style="list-style-type: none"> + Map and coordinates of survey area + Area of survey + Water depth 	Advised Santos if operate in area and whether any issues
Commencement of Environment Plan (EP) Preparation and Related Consultation	Oct 2016	Notification of commencement of EP preparation and consultation	Information Sheet #1 detailing: <ul style="list-style-type: none"> + Activity + Timing + Location + Contact person 	Within 2 weeks advise Santos: <ul style="list-style-type: none"> + If further consultation is required + Areas of concern + Method of consultation going forward + Type of information would like
	Oct 2016	After 2 weeks of providing Information Sheet #1 follow-up with stakeholders that have not provided feedback		Provide feedback to Santos as per above
Identification of relevant persons	Oct 2016	Identify relevant persons based on the feedback from stakeholders during early and commencement of EP notifications	Stakeholder Engagement Plan detailing for each relevant person: <ul style="list-style-type: none"> + Relevant functions, interest or activities + Area of interest or concern + Ongoing form of engagement 	
Provide relevant information	Nov to Dec 2016	Provide information to relevant person so they can determine how their functions, interests and activities may be affected	Information Sheet #2 detailing: <ul style="list-style-type: none"> + Activity description + Description of environment + Potential risks and impacts + Proposed controls and management strategies + Contact person + Additional information as requested + Stakeholder engagement 	Advise Santos of impacts on functions/interest/ activities, claims or objections Request further information as required
Collate, assess and address issues raised and provide response to Stakeholders	Oct to Dec 2016	Assess stakeholder's claims or objections	Provide information as to how stakeholder's claims or objections addressed and documented in the EP	Advise Santos if claims or objections adequately addressed or further engagement required
Submission of EP	Dec 2016	Submission of EP to NOPSEMA	Email notification from Santos to relevant persons Email notification from NOPSEMA portal if registered	For information
EP Acceptance	2017	NOPSEMA review and acceptance	Email notifications when NOPSEMA provide feedback and if accepted EP Summary once published on NOPSEMA website	For information

Stakeholder consultation just prior, during and after surveys

Timing	Santos	Information	Stakeholder
3 weeks prior to survey activity start	Provide survey activity communications plan to relevant stakeholders; formal notifications to regulators	Survey activity communications plan detailing: + Vessel details and contact numbers + Santos contact person + Timings	For information Advise Santos if further information is required
2 weeks prior to start	Weekly survey activity reports to relevant stakeholders begin	Vessel details, movements past and planned, coordinates	For information Advise Santos if further information is required
During	Manage stakeholder queries via email/telephone	Information as required	Concerns addressed or other issues raised
End of activity	Notification to relevant stakeholders and regulators that survey completed email/phone	Conclusion of survey	For information
One week after end of activity	Weekly survey activity reports conclude	Summary of survey activity and next steps	For information

Contact us

If you would like further information about the proposed surveys or wish to provide feedback, or merely confirm that you are a relevant person, please go to:

www.santos.com/what-we-do/activities-northern-territory/bonaparte-basin/

Or send an email to Stakeholder.Enquiries@santos.com

Or contact:

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Santos – an Australian Pioneer

An Australian energy pioneer since 1954, Santos is a leading oil and gas producer, supplying Australian and Asian customers. With its origins in the Cooper Basin, Santos is one of Australia's biggest producers of gas to the domestic market, and operates in all mainland Australian states and the Northern Territory.

Since its first offshore discovery off the north-west of Western Australia in the 1980s, Santos has developed extensive offshore exploration experience in most offshore basins of Australia, including the Carnarvon, Browse, Bonaparte, Otway, Gippsland and Sorell basins. Santos' foundations are based on safe, sustainable operations and working in partnership with host communities, governments, business partners and shareholders.



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