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OtwaySPAN Multi-Client 2D Marine Seismic Survey

Environment Plan Summary

June 2015

GX Technology Corporation

Rev 1

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SOLUTIONS 2 VALUE

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1 INTRODUCTION

GX Technology Corporation is the titleholder for the proposed activity and is a 100% subsidiary of ION Corporation. From here on in the titleholder will be referred to as 'ION'.

During the proposed activities, a survey vessel will traverse the pre-determined sail lines (indicative placing of sail lines is provided in Figure 2-1) within the survey area at a speed of approximately 8-9 km/hr. As the vessel travels along the sail lines a series of sound pulses (approximately every 20 seconds) will be directed down through the water column and seabed. The sound is attenuated and reflected at geological boundaries and the reflected signals are detected using sensitive pressure and velocity sensors arranged along a streamer towed behind the survey vessel. The reflected sound is then processed to provide information about the structure and composition of geological formations below the seabed in an attempt to identify potential hydrocarbon reservoirs.

The proposed operational area spans over a wide range of environments between 30 to 6,000 m water depths both on and off the continental shelf, in canyons and on large flat sandy bottoms.

1.1 Schedule

ION proposes to conduct 2D seismic data acquisition activities within a defined survey area in Commonwealth waters (OtwaySPAN) within the data acquisition season of November to May over a three year time period, commencing in Q4 2015, at the earliest.

1.2 Compliance

All activities conducted during operations will comply with legislative requirements established under relevant Commonwealth and State acts and regulations, and in line with applicable best practice guidelines and management procedures; in addition to the OPGGS Act and OPGGS(E)R.

ION is committed to protecting the environment and consequently has a corporate Environment Policy that provides a public statement of the company commitment to protecting the environment during offshore operations, including seismic surveys.

2 ACTIVITY DESCRIPTION

2.1 Activity location

The total survey line length will be up to ~11,000 km covering an area of ~665,000 km^2 (Figure 2-1). The survey area lies entirely in Commonwealth waters adjacent to South Australia (SA), Victoria (VIC) and Tasmania (TAS) states. Data acquisition will occur along predefined sail lines within the survey area; the exact positioning of the sail lines is yet to be determined, but are unlikely to be placed less than 25 km apart with the majority spaced at greater distances. Indicative sail lines are shown in Figure 2-1 although these may change as the survey schedule is finalised. All sail lines will occur within the survey area boundary and will not enter State waters (even where the survey area may overlap with State waters, for example King Island and Deal Island).

Boundary coordinates for the survey area are shown in Table 2-1. The survey area is located 44 km south of Port Lincoln (SA), 85 km south of Kingscote (SA), 13 km south of Portland (VIC), 12 km south of Flinders (VIC), 15 km north of Devonport (TAS) and 11 km west of Stahan (TAS). The water depths in the survey area are in the range of ~0 to 6,000 m although the vessel will be restricted to water depths > 30 m at all times.

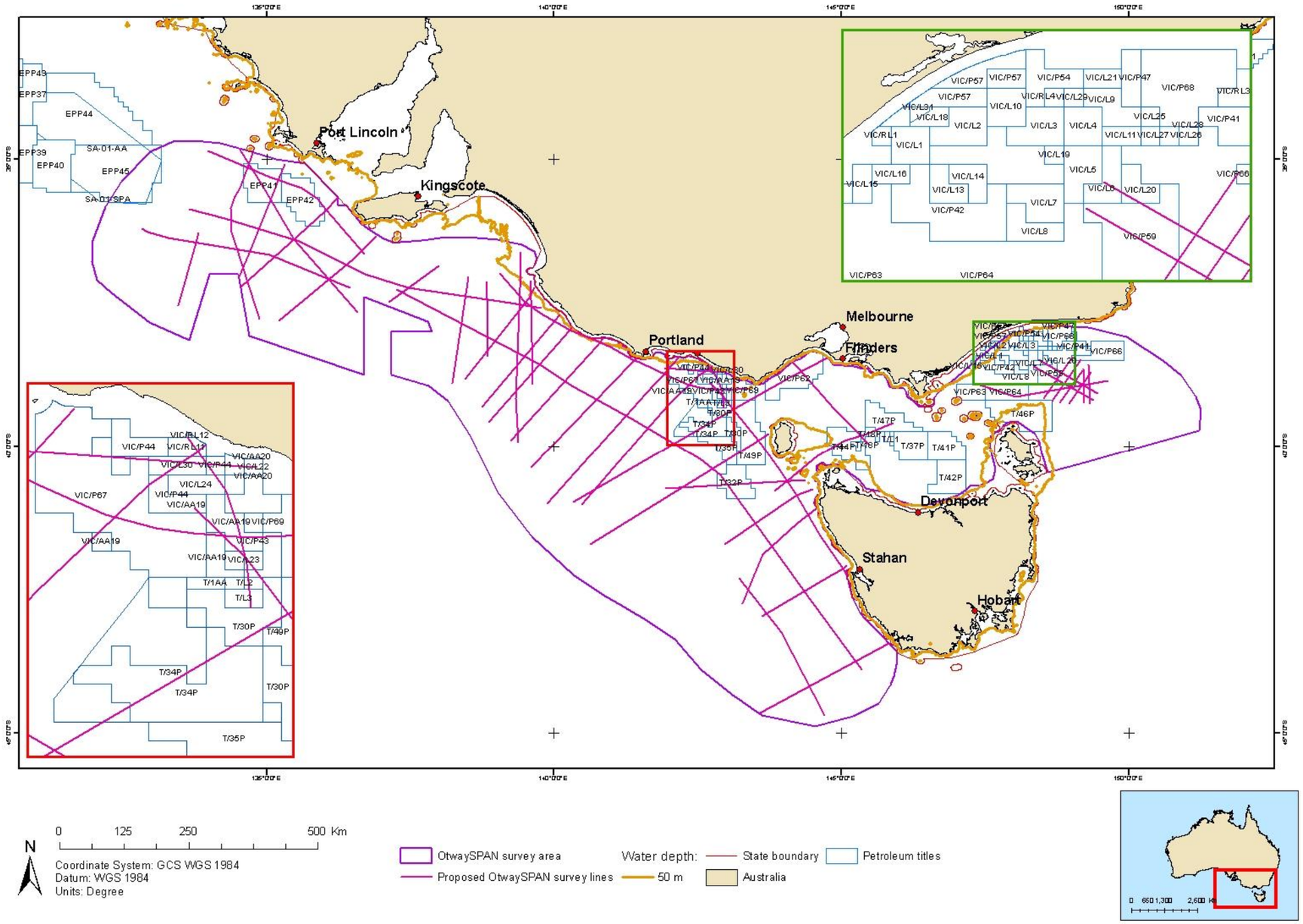

Figure 2-1: OtwaySPAN survey area and proposed survey lines[1]

[1] Proposed survey lines are yet to be finalised, final survey lines will be circulated to all stakehodlers 3 months prior to survey commencement

Table 2-1: Boundary co-ordinates for the survey area

Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Latitude
140.1319	-37.6574	141.9616	-38.476	145.0757	-38.608	148.4897	-40.1466	144.5629	-40.6229	145.0897	-42.196	133.9997	-37.0024	139.5374	-36.9916
140.1676	-37.6915	142.0122	-38.4824	145.1613	-38.6009	148.443	-39.9229	144.6067	-40.6254	145.1074	-42.3138	133.6546	-38.145	139.5645	-37.0087
140.2105	-37.7428	142.0533	-38.4657	145.2771	-38.6169	148.3633	-39.7884	144.5985	-40.6781	145.1169	-42.3546	132.9523	-37.836	139.6108	-37.0127
140.2181	-37.7643	142.0856	-38.4407	145.3663	-38.6508	148.176	-39.651	144.6203	-40.7972	145.1612	-42.5313	132.2984	-37.3266	139.6311	-37.0049
140.2243	-37.785	142.1056	-38.4464	145.4411	-38.6419	148.0797	-39.5779	144.6306	-40.8457	145.1961	-42.6391	132.0476	-37.1088	139.6465	-37.023
140.2618	-37.8399	142.166	-38.4501	145.4982	-38.7114	147.971	-39.5619	144.5761	-40.8667	145.2533	-42.7664	131.9486	-36.7854	139.6657	-37.0376
140.2859	-37.8702	142.2004	-38.4535	145.6176	-38.7613	147.8833	-39.5924	144.5397	-40.912	145.3291	-42.9043	131.9684	-36.4093	139.6582	-37.0562
140.2821	-37.883	142.2517	-38.4591	145.7281	-38.7631	147.8147	-39.6419	144.5345	-40.9394	145.4049	-43.0084	132.1944	-35.8321	139.6545	-37.0824
140.2885	-37.9058	142.2866	-38.4498	145.7905	-38.8558	147.7513	-39.7428	144.5397	-40.968	145.5811	-43.1876	132.4721	-35.3814	139.6547	-37.0988
140.3149	-37.9369	142.3164	-38.4343	145.8386	-38.9646	147.6767	-39.7578	144.5326	-40.9854	145.9636	-43.5892	132.965	-34.8716	139.6577	-37.1085
140.3451	-37.9675	142.3597	-38.4306	145.9278	-38.9966	147.6002	-39.8221	144.5351	-41.0294	145.9669	-43.7501	133.3676	-34.7	139.6638	-37.1224
140.3947	-37.9911	142.5051	-38.4789	145.9902	-38.9859	147.5753	-39.9719	144.559	-41.0697	145.9089	-44.0163	133.7486	-34.6783	139.6706	-37.1363
140.4453	-38.0132	142.5765	-38.5235	146.0829	-38.9895	147.6198	-40.1751	144.5907	-41.0977	145.8494	-44.1608	134.1986	-34.7168	139.6719	-37.1591
140.4977	-38.0591	142.7452	-38.6089	146.1239	-39.0483	147.6769	-40.3997	144.5967	-41.179	145.6436	-44.4783	134.6823	-34.8605	139.6668	-37.1739
140.6349	-38.1117	142.8438	-38.6875	146.1488	-39.1393	147.6351	-40.5804	144.6002	-41.2234	145.1988	-44.7044	135.1658	-34.9975	139.6671	-37.1901
140.7722	-38.118	142.9625	-38.7068	146.2451	-39.2195	147.5057	-40.6564	144.6245	-41.2812	144.5362	-44.8731	135.668	-35.0808	139.6761	-37.2155
140.8177	-38.1075	143.0685	-38.7535	146.3342	-39.3033	147.3809	-40.692	144.6516	-41.3365	143.6175	-44.6813	136.233	-35.661	139.7198	-37.2697
140.929	-38.1222	143.1968	-38.8372	146.4144	-39.3211	147.2348	-40.7043	144.6872	-41.376	143.0833	-44.3209	136.2328	-35.8187	139.7559	-37.3253
141.0913	-38.1608	143.3619	-38.8603	146.5274	-39.314	147.1748	-40.751	144.6716	-41.3971	142.5605	-43.8968	136.3828	-35.8187	139.7803	-37.355
141.1923	-38.2354	143.4227	-38.8872	146.5934	-39.2943	147.024	-40.8682	144.6747	-41.4366	142.0916	-43.3693	136.6434	-36.1189	139.7995	-37.3847
141.2883	-38.3152	143.4937	-38.9259	146.6201	-39.2551	146.5146	-41.02	144.6972	-41.4687	141.6063	-43.0326	136.797	-36.244	139.8131	-37.4103
141.2798	-38.3533	143.5457	-38.9304	146.6148	-39.1571	146.2757	-41.0307	144.7267	-41.4893	141.2165	-42.8045	137.0289	-36.3809	139.8363	-37.4381
141.2988	-38.4084	143.5999	-38.9215	146.6821	-39.0624	146.019	-40.9665	144.7494	-41.5181	140.8386	-42.5867	137.2242	-36.4576	139.863	-37.4516
141.3302	-38.4388	143.6429	-38.8964	146.9963	-38.7988	145.7112	-40.8054	144.7884	-41.5662	140.3306	-42.2501	137.3322	-36.4503	139.8846	-37.4796
141.4336	-38.467	143.7236	-38.8492	147.3751	-38.476	145.4272	-40.7419	144.818	-41.6126	139.6098	-41.5875	137.6918	-36.4211	139.9008	-37.4948
141.5594	-38.4889	143.8029	-38.7802	147.7613	-38.1727	145.3038	-40.5915	144.828	-41.6577	139.0291	-40.8213	138.1196	-36.3569	139.9221	-37.5199
141.5897	-38.4865	143.9236	-38.7323	147.924	-38.0554	145.0913	-40.4275	144.8405	-41.7315	138.5355	-39.8192	138.6641	-36.3725	139.9788	-37.5574
141.6108	-38.4682	144.0175	-38.6376	148.171	-37.9854	145.0377	-40.3815	144.8639	-41.7553	138.1552	-39.2107	139.0288	-36.3997	140.0287	-37.5863
141.634	-38.4646	144.096	-38.5592	148.698	-37.899	144.99	-40.3514	144.961	-41.836	137.813	-38.954	139.4316	-36.4889	140.0377	-37.6034
141.6779	-38.4717	144.1904	-38.5075	149.2971	-37.936	144.8788	-40.3182	145.0169	-41.8871	137.1683	-38.7624	139.6562	-36.6065	140.054	-37.6178
141.7124	-38.4599	144.2909	-38.4689	149.9648	-38.0967	144.7345	-40.3393	145.0747	-41.9387	137.1697	-38.0024	139.7027	-36.7354	140.0829	-37.6335
141.7331	-38.432	144.433	-38.3649	150.5988	-38.5016	144.6986	-40.3062	145.1234	-41.9768	137.8747	-38.0024	139.6515	-36.8403	140.1319	-37.6574
141.7365	-38.4046	144.5559	-38.356	150.9202	-38.7741	144.6387	-40.302	145.1745	-42.0534	137.7936	-37.8218	139.6233	-36.8999		
141.7547	-38.3803	144.664	-38.3782	151.1649	-39.1317	144.5759	-40.349	145.1916	-42.1036	136.6997	-37.4024	139.6001	-36.8939		
141.8056	-38.3672	144.7769	-38.4825	151.26	-39.3634	144.5717	-40.4531	145.1901	-42.1398	136.6996	-38.7561	139.5645	-36.8974		
141.8689	-38.3757	144.834	-38.5627	151.2193	-39.7337	144.5347	-40.5332	145.1392	-42.1474	134.689	-38.0812	139.542	-36.9131		
141.9211	-38.4049	144.8921	-38.5902	149.1991	-40.2969	144.5187	-40.569	145.1119	-42.1569	134.4986	-37.0014	139.527	-36.9349		
141.9299	-38.4513	145.0133	-38.5795	148.5854	-40.4668	144.5304	-40.6004	145.094	-42.1758	134.2423	-37.0014	139.5267	-36.9653		

2.2 Timing and Duration of the Activity

The survey will take approximately 110 days to acquire data in total, occurring within the acquisition window of November to May (inclusive), commencing on or after November 2015, and subsequent potential phases within 3 years of commencement date. This acquisition window was chosen to avoid adverse weather conditions and whale migrations (southern right) which occur throughout the winter months and which have the potential to pose additional, avoidable risks and excessive downtime, prolonging the overall duration of the survey.

The order of acquisition of the survey lines will be structured in order to acquire data in areas such as the Bonney coast and Kangaroo Island outside of sensitive time periods, such as peak blue whale feeding.

2.3 Seismic Programme

2.3.1 Survey Parameters

The marine seismic survey proposed is a conventional 2D survey similar to most others conducted in Australian waters in terms of technical methods and procedures. No unique or unusual equipment or operations are proposed. The survey will be conducted using a purpose-built seismic vessel.

The seismic receiver array is intended to comprise a single streamer, with a length of approximately 10 km. Streamer depth will be approximately 15 m. Given the type of geology and depth of targets of interest, it is considered that the most suitable operating pressure of the seismic energy source will be approximately 2,000 pounds per square inch (psi) with a total maximum source volume of 6,300 cubic inch cubic inches (cui).

2.4 Vessels

2.4.1 Seismic survey vessel

A purpose built seismic survey vessel, such as the *M/V Hawk Explorer,* will be used throughout the survey. The survey vessel will have all necessary certification/registration and will be fully compliant with all relevant MARPOL and SOLAS convention requirements for a vessel of its size and purpose.

2.4.2 Support vessels

At least one support vessel will accompany the survey vessel to maintain a safe distance between the survey array and other vessels and manage interactions with shipping and fishing activities if required. The support vessels are yet to be selected; however, they will use Marine Gas Oil (MGO) fuel only and will be of smaller size compared to the proposed survey vessel.

Support vessels will also re-supply the seismic survey vessel; including refueling if required.

3 DESCRIPTION OF THE ENVIRONMENT

The environmental values and sensitivities considered relevant to the planned activities and potential unplanned events scheduled to occur within the survey area boundaries are described in this section. Furthermore, sensitive receptors of the wider environment may also be impacted by planned and unplanned events outside of the survey area. Planned events include elevated noise levels from seismic discharges and unplanned event includes the worst case hydrocarbon spill scenario, a MGO spill as a result of a fuel tank rupture. The maximum credible extent of a surface slick was modelled for a potential unmitigated hydrocarbon spill caused by a fuel tank rupture and was estimated to extend a maximum of 55 km outside the survey area boundary.

Underwater sound exposure levels (SELs) may be elevated above ambient up to 200 km from the survey vessel depending upon the location. Towards the coast, SELs are estimated to reduce to less than 120 dB re 1 μPa^2.s within 70 km. Given that the majority of environmental sensitivities are found in shallower areas or along the shelf break, which are included in the survey area or within 70 km compared to the deeper, open ocean seaward of the survey area. Therefore, a 70 km buffer around the survey area is considered to encompass all relevant environmental sensitivities that may be impacted by planned or unplanned activities.

The survey area predominantly lies within the Southeast and Southwest Marine Region over the Bight, Bass, Gippsland, Sorrell and Otway basins covering water depths between approximately 30 m to 6,000 m.

3.1 Physical Environment

The oceanography of the Southeast and Southwest Marine Region is typified by a high energy, swell dominated wave regime and a coastline exposed to a persistent westerly swell (Edgar, 1984).

3.1.1 Currents

The southeast region represents an important ‘gateway’ between the Pacific and Indian Oceans and is strongly influenced by the East Australian current (EAC) from the northeast.

The EAC is a major western boundary current and it carries large volumes of warm, nutrient poor water southwards into the region. The EAC is highly variable and its flow is associated with large (300 km) eddies which also move southwards. Some of these features reach as far as TAS and drift into the Indian Ocean south of Australia. The waters around TAS are highly seasonal and surface currents bring warm water during winter on the west coast and in summer off the east coast (Ridgway, 2009).

3.1.2 Temperature

Surface sea water temperatures surrounding TAS/VIC/NSW vary from 14°C in the summer/autumn to 10°C in the winter/spring. Open seawater temperatures in SA/Great Australian Bight (GAB) vary from a mean summer/autumn sea surface temperature of 18°C to a mean winter/spring sea surface temperature of 14°C (Bye, 1998).

3.1.3 Wind

Westerly and south-westerly winds are predominantly found in the waters surrounding TAS. Whereas a seasonal, atmospheric cyclonic cycle maintains a high pressure ridge over the SA Basin in

summer, resulting in predominantly south-easterly winds. Average wind speeds of 8 m/s, and maximum wind speed of 22 m/s per annum have been recorded throughout the region (BP, 2013).

3.2 Biological Environment

3.2.1 Biological Productivity

The rich marine biodiversity and high levels of endemism of this region are, in part, due to the long east-west extent of the southern coastline and the long period of geological isolation. It is estimated that 85% of fish species, 95% of molluscs and 90% of echinoderms of these waters are endemic, compared to levels of 10-15% in tropical waters (Wilson and Allen, 1987). Similarly, the marine macroalgal diversity within these bioregions is among the highest in the world, with over 75% endemism among the red algae species (Womersley 1981, 1984).

3.2.2 Benthic Habitats

Benthic communities across the survey area are determined by the seafloor habitat, and have a wide distribution and diversity. Infauna communities were reported to be rich and diverse, and benthic invertebrate communities were identified as some of the most diverse soft sediment ecosystems, comprising mainly sponges, octocorals, ascidians and bryozoans (Poore *et al*., 1985; Wilson and Poore, 1987).

The majority of benthic surveys in TAS waters are concentrated in the south east where there are vast and extensive sea mounts, highlighting rock reefs as benthic habitats (notably not within the survey area) (GeoScience Australia, 2014).

The water depths of the survey area range from > 30 m to 6,000 m, and the majority of the survey area occurs in water depths deeper than the shelf (>200 m). While high biodiversity has been observed at water depths similar to the shallowest section of the survey area in VIC, SA and TAS waters (e.g. the outer shelf region), such biodiversity is less evident at greater depths (Currie and Sorokin, 2011) which is more representative of the proposed survey area.

3.2.3 Commonwealth Marie Reserves (CMRs)

A summary of the CMRs within the survey area and the wider environment potentially impacted by planned events is given in Table 3-1 below and shown Figure 3-1.

All CMRs in the South-East CMR Network are managed under the South-East Commonwealth Marine Reserves Network Management Plan 2013-2023, which prescribes how activities within the reserves will be managed. Mining operations (including exploration, such as marine seismic surveys) are permitted in Special Purpose zones (IUCN VI) and Multiple Use Zones (IUCN VI), in accordance with a class approval that has been issued by the Director of National Parks.

At present there are no management plans in place for the South-West CMR Network. For these CMRs, transitional management arrangements are currently in place and will apply until statutory management plans come into effect. The Director of National Parks has issued a general approval that provides for mining (including exploration, such as marine seismic surveys) to continue in the South-West CMR Network while management plans are prepared.

Key Ecological Features (KEFs) occur in both state and commonwealth waters, and are designated for areas of unique or valued biodiversity or productivity. A summary of the KEFs occurring within the survey area and wider environment are shown in Table 3-1 and Figure 3-2.

Table 3-1: Summary of CMRs and KEFs within the survey area and the wider environment potentially impacted by planned events

Feature	Survey Area	Wider Environment
Commonwealth Marine Reserves (CMR) *IUCN Category:* *Ia - Strict nature reserve* *II - National Park* *IV - Habitat/species management area* *VI - Managed Resource Protected Area*	• South East CMR Network	
	• Apollo Multiple Use Zone (IUCN VI) • Beagle Multiple Use Zone (IUCN VI) • Franklin Multiple Use Zone (IUCN VI) • Murray Multiple Use Zone (IUCN VI) and Special Purpose Zone (IUCN VI) • Nelson Special Purpose Zone (IUCN VI) • Tasman Fracture Multiple Use Zone (IUCN VI) and Special Purpose Zone (IUCN VI) • Zeehan Multiple Use Zone (IUCN VI) and Special Purpose Zone (IUCN VI)	• Boags Multiple Use Zone (IUCN VI) • East Gippsland Multiple Use Zone (IUCN VI) • Flinders Sanctuary Zone (IUCN Ia) and Multiple Use Zone (IUCN VI) • Murray Sanctuary Zone (IUCN Ia) • Tasman Fracture Sanctuary Zone (IUCN Ia)
	• South West CMR Network	
	• Western Eyre Marine National Park Multiple Use Zone (IUCN VI) and Special Purpose Zone (IUCN VI) • Western Kangaroo Island Special Purpose Zone (IUCN VI) •	• Southern Kangaroo Island Special Purpose Zone (IUCN VI) • Great Australian Bight Multiple Use Zone (IUCN VI) • Western Eyre Marine National Park Zone (IUCN II) • Western Kangaroo Island Marine National Park Zone (IUCN II)
Key Ecological Features (KEFs)	• Ancient coastline at 90-120m depth: South-west (see Western and Southern Kangaroo Island CMR) • Big Horseshoe Canyon: South-east • Bonney Coast Upwelling:	No additional KEFs identified

Feature	Survey Area	Wider Environment
	South-east • Kangaroo Island Pool, canyons and adjacent shelf: South-west (see Western and Southern Kangaroo Island CMR) • Seamounts South and east of TAS: South-east • West Tasmanian Canyons • Upwelling East of Eden: South-east (see East Gippsland CMR)	

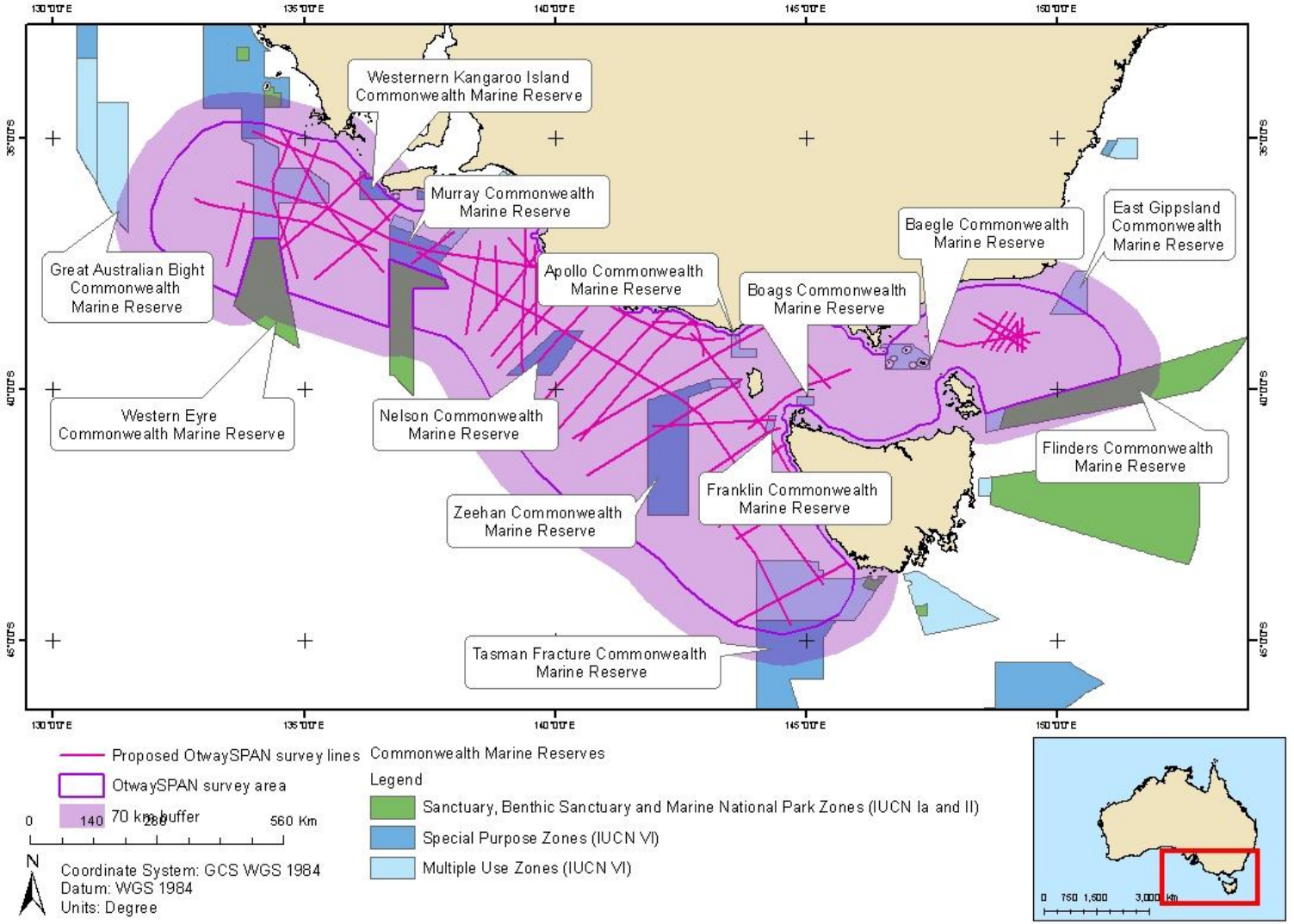

Figure 3-1: Commonwealth Marine Reserves with the survey area and wider environment

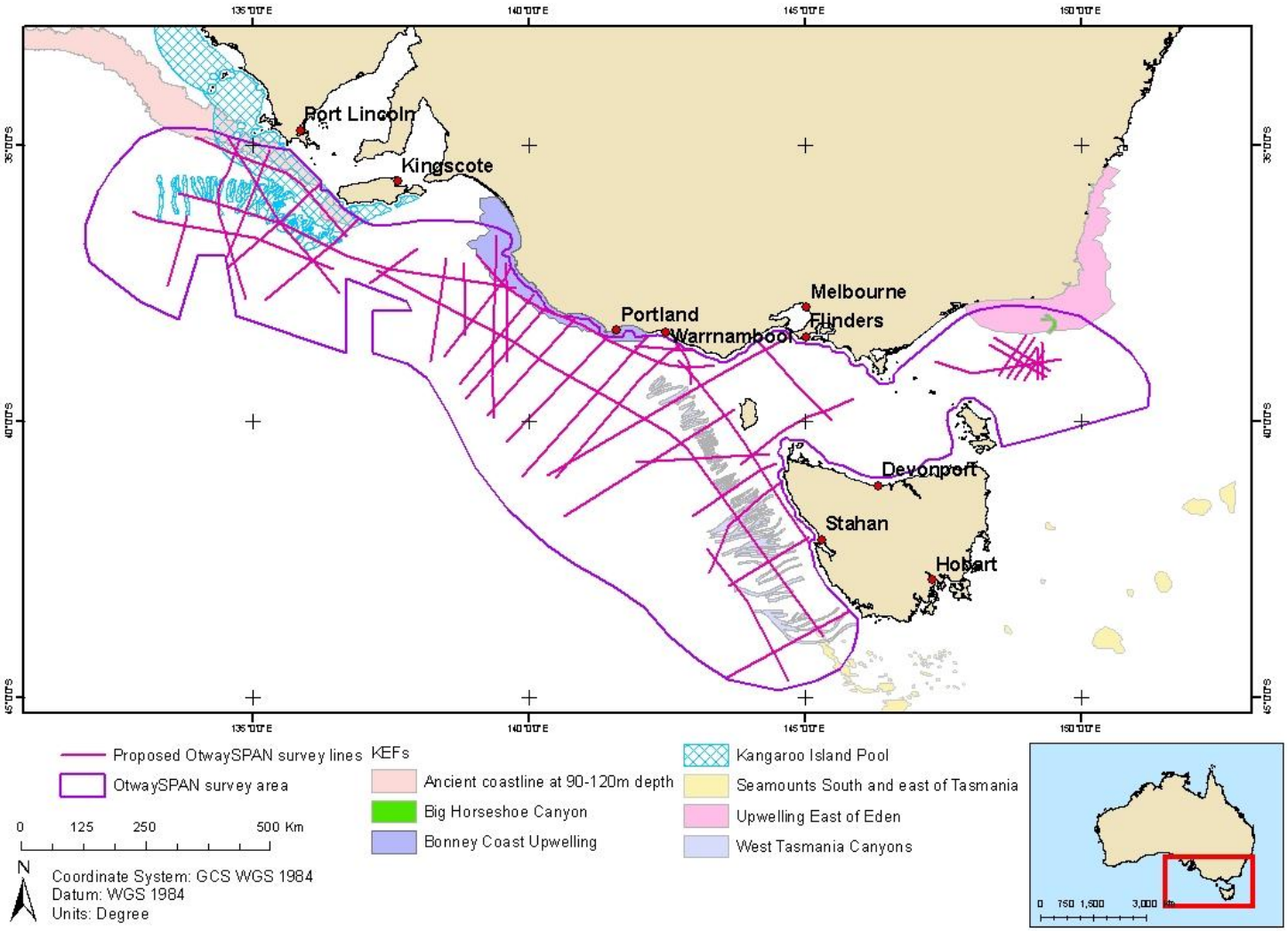

Figure 3-2: Key Ecological Features occurring within the survey area

3.2.4 State Protected Areas

While the survey vessel will not operate in State waters (and therefore State-managed protected areas), some State managed protected areas may occur within the wider environment. A summary of these is provided in Table 3-2.

Table 3-2: State Protected Areas within the wider environment (70 km)

Feature	Wider Environment[2]
National Marine Parks (MP)/State Marine Reserves for SA[3], TAS[4] and VIC[5]	Kent Group MP (TAS; see Beagle CMR)
	Western Kangaroo Island MP (SA; see Southern Kangaroo Island CMR)
	Southern Spencer Gulf MP (SA; see Southern Kangaroo Island CMR)
	Encounter MP (SA; see Southern Kangaroo Island CMR)
	Southern Kangaroo Island MP (SA; see Southern Kangaroo Island CMR)
	Port Davey MP (TAS; see Tasman Fracture CMR)
	Nuyts Archipelago MP (SA; see Western Eyre CMR)
	Investigator MP (SA; see Western Eyre CMR)
	Sir Joseph Banks Group MP (SA; see Western Eyre CMR)
	Thorny Passage MP (SA)
	Neptune Islands Group MP (SA)
	Gambier Islands Group MP (SA)
	Franklin Harbour MP (SA)
	Upper Spencer Gulf MP (SA)
	Lower Yorke Peninsula MP (SA)
	Upper Gulf St Vincent MP (SA)
	Upper South East MP (SA)
	Lower South East MP (SA)

[2] The proposed 2D survey will not enter state waters

[3] Governed by Department of Environment, Water and Natural Resources (DEWNR): South Australia

[4] Governed by Parks and Wildlife Tasmania

[5] Governed by Parks Victoria

Feature	Wider Environment[2]
	Discovery Bay MP (VIC)
	Ninety Mile Beach MP (VIC)
	Twelve Apostles MP (VIC)
	Nooramunga MP (VIC)
	Bunurong MP (VIC)
	Cape Howe MP (VIC)
	Churchill Island MP (VIC)
	Corner Inlet MP (VIC)
	French Island MP (VIC)
	Port Phillip Heads MP (VIC)
	Point Hicks MP (VIC)
	Point Addis MP (VIC)
	Wilsons Promontory MP (VIC)
	Yaringa MP (VIC)
VIC[6] State Marine Sanctuaries (MS)	Mushroom Reef MS (VIC)
	Jawbone MS (VIC)
	Ricketts Point MS (VIC)
	The Arches MS (VIC)
	Eagle Rock MS (VIC)
	Beware Reef MS (VIC)
	Barwon Bluff MS (VIC)
	Merri MS (VIC)
	Point Danger MS (VIC)
	Marengo Reefs MS (VIC)

[6] Governed by Parks Victoria

Feature	Wider Environment[2]
	Point Cooke MS (VIC)
RAMSAR state marine and coastal wetlands	Logan Lagoon (TAS; RAMSAR 252)
	Lavinia Nature Reserve (TAS; RAMSAR 253)
	Cape Barren Island, east coast lagoons (TAS; RAMSAR 256)
	Corner Inlet (VIC; RAMSAR 261)
	Port Phillip Bay and Bellarine Peninsula (VIC; RAMSAR 266)
	Western Port (VIC; RAMSAR 267)
Marine and coastal listed and threatened ecological communities	Giant Kelp Marine Forests of South East Australia; EPBC listed as Endangered; Community likely to occur within area
	River Murray and associated wetlands, floodplains and groundwater systems, from the junction with the Darling River to the sea; EPBC listed as Approval Disallowed; Community likely to occur within area

3.2.5 Key Ecological Features

Ancient coastline at 90-120m depth

In addition to high productivity and aggregations of marine life, this KEF supports high levels of biodiversity and endemism. Benthic biodiversity and productivity occur where the ancient coastline forms a prominent escarpment, such as in the western Great Australian Bight, where the sea floor is dominated by sponge communities of significant biodiversity and structural complexity.

Big Horseshoe Canyon

The canyon habitat feature has produced a unique benthic community, regionally recognised for its important biodiversity. Benthic organisms in this unique feature include bioturbators, corals and filter feeders (CSIRO, 2012).

Bonney Coast Upwelling

The Bonney Coast is a narrow shelf region straddling a steep continental slope incised with numerous canyons and valleys (CSIRO, 2012). The western half of the coast experiences upwellings of cool nutrient-rich water in February–March, which supports productive and diverse marine communities, key sensitivities include:

- Blue whale migration
- The oceanographic feature allows high levels of nutrients from cold nutrient-rich waters from the bottom of the ocean and rise to the surface leading to plankton blooms

Kangaroo Island Pool, canyons and adjacent shelf

This KEF is an area of high productivity and aggregations of marine life, and the canyons and adjacent shelf break are unique seafloor features with ecological properties of regional significance.

The Kangaroo Island canyons in particular are known for their seasonal upwellings of deep ocean waters that support aggregations of krill, small pelagic fish and squid, which, in turn, attract marine mammals (e.g. pygmy blue whales, fin whales and sperm whales), sharks, large predatory fish and seabirds.

Upwelling East of Eden

Oceanographic features of the seafloor lead to upwellings of cold water in winter bringing nutrient-rich waters to the surface, boosting productivity. These upwellings result in high productivity leading to an increased biodiversity of predatory fish and oceanic seabirds including albatrosses, petrels and shearwaters.

Seamounts South and east of TAS

Large seamounts (underwater volcanoes) dot the deep seafloor in the South-east marine region and the continental block of the South Tasman Rise. Within these seamounts elevated numbers of corals, marine faunal predators and plankton occur (CSIRO, 2012).

West TAS Canyons

The multiple canyon habitat features of the west coast of TAS have produced a unique benthic community, regionally recognised for its important biodiversity. Benthic organisms in this unique feature include corals, filter feeders and bioturbators. This TAS KEF is considered important for the marine regions biodiversity provided by the unique seafloor (CSIRO, 2012).

3.3 Marine Fauna

A review of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) database (Protected Matters search tool) held by the Department of Environment (DoE) was conducted on 10/07/2014 for the survey area polygon described by the boundary coordinates.

An additional search including a 70 km buffer to account for the wider environment was also conducted. Further details of the Protected Matters search, indicating vulnerable/endangered/critically endangered and/or migratory species likely to occur within, or adjacent to, the search area (the survey area or the wider environment as defined by the 70 km buffer) are provided in the Table 3-3 below.

Table 3-3: EPBC Act Protected Species that may occur in, or relate to, the survey area and the wider environment

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Cetaceans				
Eubalaena australis	Southern right whale	Endangered; migratory	Breeding known to occur within area	Southern right whale calving buffer BIA along the SA coastline is next to the survey area
Balaenoptera musculus	Blue whale	Endangered; migratory	Foraging, feeding or related behaviour known to occur within area	Pygmy blue whale foraging and migratory BIA overlaps with survey area
Physeter macrocephalus	Sperm whale	Migratory	Foraging, feeding or related behaviour known to occur within area	Sperm whale foraging BIA overlaps with survey area
Megaptera novaeangliae	Humpback whale	Vulnerable; migratory	Species or species habitat known to occur within area	None
Balaenoptera borealis	Sei whale	Vulnerable; migratory	Species or species habitat may occur within area	None
Balaenoptera physalus	Fin whale	Vulnerable; migratory	Species or species habitat may occur within area	None
Balaenoptera bonaerensis	Antarctic minke whale	Migratory	Species or species habitat may occur within area	None
Caperea marginata	Pygmy right whale	Migratory	Species or species habitat may occur within area	None
Balaenoptera edeni	Bryde's whale	Migratory	Species or species habitat may occur within area	None
Lagenorhynchus obscurus	Dusky dolphin	Migratory	Species or species habitat may occur within area	None
Orcinus orca	Killer whale, Orca	Migratory	Species or species habitat may occur within area	None
Pinnipeds				
Neophoca cinerea	Australian sea-lion	Vulnerable	Breeding known to occur within area	Male and female foraging BIA overlaps with survey area, BIA for breeding and haul out sites are also located nearby
Marine Reptiles				
Caretta caretta	Loggerhead turtle	Endangered; migratory	Foraging, feeding or related behaviour known to occur within area	None
Chelonia mydas	Green Turtle	Vulnerable; migratory	Foraging, feeding or related behaviour known to occur within area	None

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Dermochelys coriacea	Leatherback Turtle	Endangered; migratory	Foraging, feeding or related behaviour known to occur within area	None
Eretmochelys imbricata	Hawksbill Turtle	Vulnerable; migratory	Species or species habitat known to occur within area	None
Sharks (Fish)				
Carcharias taurus	Grey nurse shark (east coast population)	Critically Endangered	Species or species habitat may occur within area	None
Carcharodon carcharias	Great white shark	Vulnerable	Breeding known to occur within area	White shark foraging BIA overlaps with survey area, high density white shark BIA is also in proximity to the survey area
Zearaja maugeana	Maugean skate, Port Davey skate	Endangered	Species or species habitat likely to occur within area	None
Isurus oxyrinchus	Shortfin mako	Migratory	Species or species habitat likely to occur within area	None
Lamna nasus	Porbeagle, Mackerel shark	Migratory	Species or species habitat likely to occur within area	None
Rhincodon typus	Whale shark	Vulnerable; migratory	Species or species habitat may occur within area	None
Birds				
Apus pacificus	Fork-tailed swift	Migratory	Species or species habitat likely to occur within area	None
Diomedea antipodensis	Antipodean albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Diomedea dabbenena	Tristan albatross	Endangered; migratory	Species or species habitat may occur within area	None
Diomedea epomophora (sensu stricto)	Southern royal albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Diomedea exulans (sensu lato)	Wandering albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Diomedea gibsoni	Gibson's albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Diomedea sanfordi	Northern royal albatross	Endangered; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Macronectes giganteus	Southern giant-petrel	Endangered; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Macronectes halli	Northern giant-petrel	Vulnerable; migratory	Species or species habitat may occur within area	None
Phoebetria fusca	Sooty albatross	Vulnerable; migratory	Species or species habitat may occur within area	None
Puffinus carneipes	Flesh-footed shearwater	Migratory	Breeding known to occur within area	Flesh-footed shearwater BIA for breeding sites located nearby to survey area
Puffinus griseus	Sooty shearwater	Migratory	Breeding known to occur within area	None
Puffinus pacificus	Wedge-tailed shearwater	Migratory	Breeding known to occur within area	None
Puffinus tenuirostris	Short-tailed shearwater	Migratory	Breeding known to occur within area	Short-tailed shearwater foraging BIA overlaps with survey area, BIA for breeding sites are located nearby to survey area
Sterna albifrons	Little tern	Migratory	Species or species habitat may occur within area	None
Sterna anaethetus	Bridled tern	Migratory	Breeding known to occur within area	None
Sterna caspia	Caspian tern	Migratory	Breeding known to occur within area	Caspian tern foraging BIA overlaps with survey area
Thalassarche bulleri	Buller's albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Thalassarche cauta (sensu stricto)	Shy albatross	Vulnerable; migratory	Breeding known to occur within area	None
Thalassarche chrysostoma	Grey-headed albatross	Endangered; migratory	Species or species habitat may occur within area	None
Thalassarche eremita	Chatham albatross	Endangered; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Thalassarche impavida	Campbell albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Thalassarche melanophris	Black-browed albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Thalassarche salvini	Salvin's albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Thalassarche steadi	White-capped albatross	Vulnerable; migratory	Foraging, feeding or related behaviour likely to occur within area	None
Fregetta grallaria grallaria	White-bellied storm-petrel (Tasman Sea), White-bellied storm-petrel (Australasian)	Vulnerable	Species or species habitat likely to occur within area	None
Halobaena caerulea	Blue petrel	Vulnerable	Species or species habitat likely to occur within area	None
Rostratula australis	Australian painted snipe	Endangered	Species or species habitat likely to occur within area	None
Pterodroma leucoptera leucoptera	Gould's petrel	Endangered	Species or species habitat may occur within area	None
Pterodroma mollis	Soft-plumaged petrel	Vulnerable	Breeding known to occur within area	None
Sternula nereis nereis	Australian fairy tern	Vulnerable	Species or species habitat known to occur within area	Fairy tern foraging BIA overlaps with survey area
Botaurus poiciloptilus	Australasian bittern	Endangered (wetland)	Species or species habitat likely to occur within area	None
Actitis hypoleucos	Common sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Ardea alba	Great egret	Migratory (wetland)	Breeding known to occur within area	None
Ardea ibis	Cattle egret	Migratory (wetland)	Breeding likely to occur within area	None
Arenaria interpres	Ruddy turnstone	Migratory (wetland)	Roosting known to occur within area	None

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Calidris acuminata	Sharp-tailed sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Calidris alba	Sanderling	Migratory (wetland)	Roosting known to occur within area	None
Calidris canutus	Red knot	Migratory (wetland)	Roosting known to occur within area	None
Calidris ferruginea	Curlew sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Calidris ruficollis	Red-necked stint	Migratory (wetland)	Roosting known to occur within area	None
Calidris tenuirostris	Great knot	Migratory (wetland)	Roosting known to occur within area	None
Charadrius bicinctus	Double-banded plover	Migratory (wetland)	Roosting known to occur within area	None
Charadrius leschenaultii	Greater sand plover	Migratory (wetland)	Roosting known to occur within area	None
Charadrius mongolus	Lesser sand plover	Migratory (wetland)	Roosting known to occur within area	None
Charadrius veredus	Oriental plover	Migratory (wetland)	Species or species habitat known to occur within area	None
Gallinago hardwickii	Latham's snipe	Migratory (wetland)	Roosting known to occur within area	None
Heteroscelus brevipes	Grey-tailed tattler	Migratory (wetland)	Roosting known to occur within area	None
Limicola falcinellus	Broad-billed sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Limosa lapponica	Bar-tailed godwit	Migratory (wetland)	Roosting known to occur within area	None
Limosa limosa	Black-tailed godwit	Migratory (wetland)	Roosting known to occur within area	None
Numenius madagascariensis	Eastern curlew	Migratory (wetland)	Roosting known to occur within area	None

Scientific name	Common name	Status	Type of presence	Biologically Important Areas in proximity to survey area
Numenius minutus	Little curlew	Migratory (wetland)	Roosting known to occur within area	None
Numenius phaeopus	Whimbrel	Migratory (wetland)	Roosting known to occur within area	None
Pluvialis fulva	Pacific golden plover	Migratory (wetland)	Roosting known to occur within area	None
Pluvialis squatarola	Grey plover	Migratory (wetland)	Roosting known to occur within area	None
Rostratula benghalensis (sensu lato)	Painted snipe	Endangered; migratory (wetland)	Species or species habitat likely to occur within area	None
Tringa glareola	Wood sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Tringa stagnatilis	Marsh sandpiper	Migratory (wetland)	Roosting known to occur within area	None
Xenus cinereus	Terek sandpiper	Migratory (wetland)	Roosting known to occur within area	None

3.3.1 Sensitive Timings for Protected Species in the Survey Area and Wider Environment

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
Cetaceans														
Antarctic minke whale														
Sei whale	Possible feeding	Port Lincoln surrounding waters Bonney upwelling Bass Strait												
Bryde's whale														
Blue whale	Feeding aggregations Migrating	Eastern GAB upwelling and Kangaroo Island canyons Bonney upwelling												
Fin whale														
Pygmy right whale														
Southern right whale	Breeding and calving Migrating	Head of Bight Fowlers Bay Encounter Bay												

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
		Portland Port Fairy Port Campbell												
Dusky dolphin														
Humpback whale	Migrating: northward (adults) and southward (adults and calves) migration	NSW coast East of TAS					Northern migration					Southern Migration		
Killer whale, Orca														
Sperm whale	Foraging	GAB Bonney upwelling TAS												
Pinnipeds														
Australian sea-lion	Foraging Haul out Breeding	Page Islands Seal Bay on Kangaroo Island Dangerous Reef Lewis Island												

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
		West Waldegrave Island Olive Island Purdiue Island												
Marine Reptiles														
Loggerhead turtle														
Green Turtle														
Leatherback Turtle														
Hawksbill Turtle														
Sharks (Fish)														
Grey nurse shark (east coast population)														
Great white shark	Foraging High density	Neptune Islands off Port Lincoln Page Islands Seal Bay on Kangaroo Island Dangerous Reef Lewis Island												

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
		West Waldegrave Island Olive Island Purdiue Island												
Maugean skate, Port Davey skate														
Shortfin mako														
Porbeagle, Mackerel shark														
Whale shark														
Birds														
Fork-tailed swift	Foraging Migrating													
Antipodean albatross	Foraging Migrating Nesting	Albatross Island Bass Strait Mewstone TAS												
Tristan albatross														
Southern royal albatross														
Wandering albatross														
Gibson's albatross														

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
Northern royal albatross														
Sooty albatross														
Buller's albatross														
Shy albatross														
Grey-headed albatross														
Chatham albatross														
Campbell albatross														
Black-browed albatross														
Salvin's albatross														
White-capped albatross														
Southern giant-petrel	Migrating Foraging													
Northern giant-petrel														
White-bellied storm-petrel (Tasman Sea), White-bellied storm-petrel (Australasian)														

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
Blue petrel														
Gould's petrel														
Soft-plumaged petrel														
Flesh-footed shearwater	Foraging Nesting	Port Lincoln coastal waters												
Sooty shearwater														
Wedge-tailed shearwater														
Short-tailed shearwater														
Little tern	Foraging Nesting	Port Lincoln coastal waters												
Bridled tern														
Caspian tern														
Australian fairy tern														
Australasian bittern														
Australian painted snipe	Foraging													

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
Latham's snipe	Nesting													
Painted snipe														
Common sandpiper	Foraging Nesting													
Sharp-tailed sandpiper														
Curlew sandpiper														
Broad-billed sandpiper														
Wood sandpiper														
Marsh sandpiper														
Terek sandpiper														
Great egret	Foraging Nesting													
Cattle egret														
Ruddy turnstone														
Sanderling														
Red knot														
Great knot														

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														
Red-necked stint														
Double-banded plover	Foraging													
Greater sand plover														
Lesser sand plover														
Oriental plover														
Pacific golden plover														
Grey plover														
Grey-tailed tattler	Foraging													
Bar-tailed godwit	Foraging													
Black-tailed godwit														
Eastern curlew	Foraging													
Little curlew														
Whimbrel	Foraging													

Sensitivity	Description of presence	Key locality	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Potential 2D acquisition period														

Key

	Peak presence
	Known presence
	Potential presence in region

3.4 Socioeconomic Environment

Socio-economic activities that may occur within the survey area and surrounds include commercial fishing and shipping; and to a lesser extent, recreational fishing and tourism (Table 3-4).

Table 3-4: Receptor within survey area and the wider environment

Category	Receptor within survey area and the wider environment
Commonwealth Commercial fisheries	Bass Strait Central Zone Scallop Fishery
	Small Pelagic Fishery
	Southern and Eastern Scalefish and Shark Fishery
	Commonwealth Trawl and Scalefish Hook Sectors
	Shark Gillnet and Shark Hook Sectors
	Southern Squid Jig Fishery
	Skipjack Tuna Fisheries
	Southern Bluefin Tuna Fishery and associated aquaculture
	Western Tuna and Billfish Fishery
	Eastern Tuna and Billfish Fishery
	Great Australian Bight Trawl Sector
State Commercial Fisheries	SA: Primary Industries and Region SA (PIRSA)
	Abalone Fishery
	Blue Crab Fishery
	Charter Boat Fishery
	Lakes and Coorong Fishery
	Marine Scalefish Fishery
	Miscellaneous Fishery
	Prawn Fisheries: Gulf St Vincent, Spencer Gulf and West Coast
	Rock Lobster Fishery
	Sardine Fishery
	VIC: Department of Environment and Primary Industries (DEPI)
	Rock Lobster Fishery
	Giant Crab Fishery
	Scallop Fishery
	Snapper Fishery
	Black Bream Fishery
	Sea Urchin Fishery
	Abalone Fishery
	Eel Fishery
	King George Whiting Fishery
	Abalone Aquaculture
	TAS: Department of primary Industries, Parks, Water and Environment (DPIPWE)
	Abalone Fishery
	Commercial Dive Fishery
	Giant Crab Fishery
	Commercial Scalefish Fishery
	Scallop Fishery
	Shellfish Fishery
	Seaweed Fishery
	Rock Lobster Fishery
Recreational fishing	Tourism and charter boats
Petroleum Exploration and	SA
	Bight Petroleum Pty Ltd
	Chevron Australia New Ventures Pty Ltd

Category	Receptor within survey area and the wider environment
Production	VIC
	Esso Australia Resources Pty Ltd
	Basin Oil Pty Ltd
	BHP Billiton Petroleum (VIC) Pty Ltd
	Origin Energy Resources Ltd
	Santos Limited
	Roc Oil (Vic) Pty Ltd/ Cooper Energy
	Nexus Energy VICP54 Pty Ltd
	Carnarvon Hibiscus Pty Ltd
	Bass Strait Oil Company Ltd
	Seaquest Petroleum Pty Ltd
	Trident Energy Limited
	WHL Energy Limited
	Cape Energy (VIC) Pty Ltd
	TAS
	Origin Energy Resources Ltd
	3D Oil T49P Pty Ltd
Commercial Shipping	Bass Strait and the surrounding region is one of the busiest shipping regions in Australia, consisting of both passenger and cargo vessels travelling between mainland Australia and TAS as well as between Australia and New Zealand. The main shipping channel for vessels (e.g., cargo tankers) travelling between major Australian and foreign ports is located south of VIC, 75 km south of Warrnambool. This shipping channel is used by over 1,000 vessels per year, or about 3-4 vessels per day. Fishing vessels will also traverse and fish in the survey area, leading to light fishing traffic throughout the region.
Tourism and recreation	Recreational fishing and tourism such as, diving and snorkeling will likely be undertaken in the wider environment adjacent to the survey area, particularly along the shallow coastal waters of TAS, SA and VIC; 1-3 km from the coastline, recreational diving is to a depth of 30 m and therefore could overlap with the shallower limits of the survey area, although given the distance of the survey area from the coastline this will likely be limited. Tourist hotspots are considered to be focused in state marine parks and sanctuaries in TAS, SA and VIC state waters.
Defence activities	The survey area overlaps part of the South Australian Exercise Area (SAXA) and restricted Airspace R282. As such, defence activities may occur within the survey area.
World Heritage	No known World Heritage sites within the survey area and the wider marine environment (70 km).
National Heritage	No known national heritage sites within the survey area. However a few sites with coastal boundaries have been identified within the wider environment (70 km), these include (DoE, 2014p): • HMVS Cerberus (marine) • Point Cook Air Base (terrestrial) • Point Nepean Defence Sites and Quarantine Station (terrestrial)

Category	Receptor within survey area and the wider environment
	• TAS Wilderness (terrestrial) • Western TAS Aboriginal Cultural Landscape (terrestrial)
Commonwealth Heritage	No known Commonwealth Heritage sites within the survey area. However one site with a coastal boundary has been identified within the wider environment (70 km; DoE, 2014p): • HMAS Cerberus Marine and Coastal Area There are no known indigenous cultural heritage values or issues for the waters and seabed within the survey area and the wider environment (apart from the Western TAS Aboriginal Cultural Landscape). Similarly, there are no current or pending Native Title Determinations for the waters and seabed within the survey area and the wider environment.

4 NOISE IMPACTS

4.1 Acoustic source

Three primary modelling studies completed by Curtin University Centre for Marine Science and Technology (CMST) are used as the basis of expected sound exposure levels for the OtwaySPAN 2D MSS:

1. The WestraliaSPAN 2D MSS modelling completed for 2D seismic acquisition of a 6300 cui energy source in Western Australia (Parnum and Duncan 2012a)
2. BightSPAN 2D MSS modelling 2D seismic acquisition of a 5880cui energy source in the Great Australian Bight South Australia (Duncan and parsons 2009)
3. BP modelling for Ceduna 3D MSS in the Great Australian Bight of a >4000cui energy source (CMST 2013).

4.2 Disturbance to Planktonic Organisms

Andriguetto-Filho *et al.,* (2005) investigated the effects of seismic exploration (~2-15m water depth) on catch rates on shrimp species before and after survey. The measured source level was approximately 196 dB re 1µPa@1m. No apparent change in catch rate occurred for the species before/after the seismic survey. Popper and Hastings (2009) reported no mortality or tissue damage on caged shrimp of several species exposed to airguns. Aerial observations associated with the 2003 Santos EPP42 Seismic Survey identified areas of krill throughout the survey program which appeared to be unaffected by the presence of the seismic vessel (Morrice *et al.,* 2003). For areas where krill might be present during the proposed survey this would not be considered to be significant at a population level and is not expected to impact on higher trophic levels (pygmy blue whale, sardines, and mackerel).

Except for fish and benthic invertebrates (scallops, oysters, abalone etc.) eggs, larvae and other minute planktonic organisms within a few metres of a compressed air seismic source, no planktonic organisms are likely to be affected significantly by seismic source discharges (McCauley, 1994). Impacts on eggs and larvae appear to be limited to receive sound exposure levels at over 230 dB re 1 µPa.s.

Overlap with Critical Planktonic Organisms

The timing of commercially important fish/invertebrates spawning in the region varies between the species, however usually occurs within late winter/early spring months as shown in Section 3.3.1. This is in contrast to the most likely timings of the proposed survey during summer and early spring, therefore impacts to spawning species will be reduced. Furthermore, the vessel will be continually moving, acquiring data along widely spaced sail lines reducing the proportion of planktonic populations that may be impacted. As such, any effect of the seismic operation on planktonic organisms is insignificant compared with the size of the planktonic population in the survey area or natural mortality rates for planktonic organisms.

Planktonic organisms are only likely to be exposed to levels that could potentially cause impact at very close ranges. For example SELs above of 210 dB re 1 µPa.s are not expected to occur outside of 30-40m from the source (Figure 4-1 & Figure 4-2). The data acquisition within shallow water environments less than 50m equates to less than 2.2% of the overall survey and an equivalent of

approximately 3 survey days. Therefore, the potential impacts to planktonic organisms in shallow water environments is considered to be infrequent and of low significance. Potential impacts to scallop larvae exposed to 161 – 165 dB re 1 µPa.s over prolonged duration at 3 second pulse rate (Aguilar de Sato *et al*., 2013) will not be replicated in the proposed survey and the risk of impact to planktonic organisms from noise emitted from the ION 2D Marine Sesimic Survey (MSS) is considered low.

4.3 Disturbance to Benthic and Pelagic Invertebrates

Crustaceans have shown remarkable resistance to high force explosive events. Studies undertaken into the effects of thirty-three (33) MSSs on catch rates of Rock Lobsters in western Victoria between 1978 and 2004 identified that there was no evidence indicating a decline in Rock Lobster catch rates for the period both on a long-term and short-term basis (Parry and Gason 2006).

In an extensive and thorough review, Moriyasu *et al*. (2004) conclude that "very limited numbers of experiments were scientifically and reasonably conducted" but the results of nine quantitative studies showed five cases of immediate (lethal or physical) impacts of seismic sources on invertebrate species and four cases of no impacts. One study showed physiological impacts and another showed no physiological impact, three cases showed behavioural impacts and one study showed no impact on behaviour (Moriyasu *et al*., 2004).

Furthermore, Christian *et al*. (2003; as cited in Moriyasu *et al*., 2004) did not detect any effects on the behaviour of snow crab *(Chionoecetes opilio*) placed in cages and put on the ocean bottom at a depth of 50 m after being exposed to sound levels of 197-237 dB from an seismic source array. Additionally, this study found no effects on catch rate of snow crab by comparing pre- and post-seismic testing. While no physiological effects were observed in examined crabs post seismic exposure, embryonic development of external eggs may be delayed after being exposed to seismic sources (Christian *et al*., 2003; as cited in Moriyasu *et al*., 2004).

Parry *et al*., (2002) found no evidence of a lethal impact of seismic surveying on commercial scallops in Bass Strait. However, it should be noted that persistent vibrations, which result in continued shell opening and closure, could potentially result in cessation of filter feeding and decreased health and survival of affected individuals, e.g. scallops hanging on lantern nets (Walmsley (2007)).

There was also no observable change in the size frequency distribution of scallops in the impacted and semi-impacted strata following seismic surveying (Harrington *et al*., 2010). The conclusion was that no short-term (< 2 months) impacts on the survival or health of adult commercial scallops (*Pecten fumatus*) were detected post the seismic survey.

Overlap with Critical Benthic and Pelagic Invertebrates and Associated Benthic Habitats

Based on current literature, risk of potential impact to commercial fisheries including scallops, abalone and oysters from the seismic airgun are expected to be very low. SEL levels are demonstrated to attenuate to below 195 re 1 μPa^2.s less than 50 m from the source, and to less than 160 re 1 μPa^2.s within 20 km from source at the worst case in deep water environments. There is high sound attenuation in shallow water environment that the commercial fisheries operate (fisheries predominantly fish in <50m water depth in TAS, SA and VIC).

Furthermore, the survey vessel is constantly moving results in benthic and pelagic invertebrates being exposed temporarily. Given the sparsely distributed sail lines, only a small proportion of the available marine environment will be potentially impacted, through a reduced seismic output, and

all seismic activity occurring in water depths greater than 30m, no physical impact to benthic invertebrates are expected on a population level. As such, the risk of impacts to benthic and pelagic invertebrates and associated benthic habitats at the adult or sub adult stages is considered low.

As such, significant impacts at the adult or sub-adult population level are not expected.

4.4 Disturbance to Fish

Studies indicate that fish (including sharks) may begin to show behavioural responses (e.g. increased swimming) to an approaching seismic array at received sound levels of approximately 156 dB re 1 µPa (rms) and active avoidance at around 168 dB re 1 µPa (rms) (McCauley *et al*., 2000). This corresponds to behavioural changes at approximately 3 km to 5 km from the seismic array, and avoidance from approximately 1 km to 2 km in about 100 m of water (McCauley *et al*., 2000).

Fish are highly unlikely to be in close enough proximity to the discharging seismic source through behavioural response, for physiological damage to the ears and lateral line to occur. Such behavioural changes present only temporary, short range, displacement of pelagic or migratory fish populations and are unlikely to have significant repercussions at the population level (McCauley, 1994).

Furthermore, the potential effects of marine seismic surveys have been summarised as part of a detailed environmental assessment of geophysical exploration for mineral resources on the Gulf of Mexico outer continental shelf (MMS, 2004). This assessment concluded that no biological significant impact on fish may occur from seismic surveys.

However, any potential impacts are expected to be isolated to individuals and not affect the population as a whole. Given the amount of available habitat across the survey area and the small proportion of the survey to be carried out in shallow water, the impact significance from underwater noise to fish is considered low.

Overlap with Critical Fish Habitat

The spawning periods of a number of pelagic and demersal species may overlap with the acquisition period (from April onwards), in addition to aggregation periods and/or migratory periods. Nevertheless, any behavioural impacts which may occur will be temporary only and given the survey vessel is constantly moving along widely spaced sail lines, are unlikely to lead to long term impacts at the population level.

The survey area overlaps with areas of the white shark foraging BIA. These areas largely overlap with distribution of their preferred food source (sea lions) and therefore will be most common in areas where sea lions are found. Behavioural impacts to sharks or the key prey (see 'Disturbance to pinnipeds below) are not expected to be significant.

4.5 Site attached fish (demersal or reefal)

While demersal and reefal fish species differ in the habitats and niches they occupy, they are both considered 'site attached' and therefore both exhibit limited ability to move away from disturbance when compared to more mobile pelagic species. A study of site-attached reef species revealed no significant effect of a 3D seismic survey on overall abundance or the species richness within coral reef fish communities (Miller & Cripps, 2013). More detailed studies conducted indicated that the threshold received SELs that could result in various sub-lethal and/or physiological effects for site attached species:

- Onset of short term reversible loss in hearing sensitivity (temporary threshold shift - TTS) at >180 dB re 1 µPa2.s
- Onset of longer term loss in hearing sensitivity (TTS/permanent threshold shift – PTS) at >187 dB re 1 µPa2.s
- TTS onset but no injury to non-auditory tissues to ~ 1 kg sized fish at >200 dB re 1 µPa2.s

Modelling conducted for WestraliaSPAN survey shows that in a variety of water depths ranging from ~60 - > 5,000 m, the estimated SEL at the seafloor was ~160 dB re 1 µPa2.s less than 10 km on the shelf from the source location (Parnum and Duncan, 2012).

The predicted SELs at 30m, 40m and 50m at a vertical angle for the 6300 cui source and the reduced 4750 cui source (to be used in water depth <50m) are presented in Figure 4-1 and Figure 4-2. SEL of the 6300 cui source air volume are expected to attenuate below 210 re 1 μPa^2.s at approximately 30m, below 200-205 dB re 1 µPa2.s at 40m and below 200 dB re 1 µPa2.s at 50m from the source. SEL of the reduced 4750 cui source is expected to be approximately 200 dB re 1 µPa2.s at 30m, 195-200 dB re 1 µPa2.s at 40m and 195 dB re 1 µPa2.s at 50m from source. As such, site attached fish species may be exposed to sound exposure levels that could cause temporary or permanent threshold shifts in hearing and short term behavioural impacts may be observed 50 m – 60 m from the source.

However the reduction of the source by disabling 25% of the source sub-arrays results in a reduction of the source SEL by approximately 2.5 dB re 1 µPa2.s and results in less sound energy being emitted into the environment and subsequently reduced risk of potential impacts to marine fauna.

Site attached fish are usually found in less than 30 m water depth, in reefal communities with high light exposure in shallow waters. As the survey will not be acquiring data in waters less than 30 m depth, coupled with the commitment to reduce acoustic source energy by 25% in water depths less than 50m, is considered that the potential impacts to site attached fish (and to all shelf species) are reduced to as low as reasonably practicable. The survey vessel is also constantly moving results in site attached fish being exposed to SELs temporarily. Furthermore, given the sparsely distributed sail lines, only a small proportion of the available marine environment will be potentially impacted.

However, any potential impacts are expected to be isolated to individuals and not affect the population as a whole, and it is considered that management controls in Table 5-1 will reduce potential impacts to ALARP. Given the amount of available habitat across the survey area and the small proportion of the survey to be carried out in shallow water, the impact significance from underwater noise to demersal and site attached fish is considered low.

Overlap with Critical Fish Habitat

Seismic activity may alter fish behaviour during spawning and pre-spawning periods, or during migrations due to the behavioural responses described above. In general behavioural responses are observed at >150 dB re 1 µPa and a startle response at 160 dB re 1 µPa, although thresholds are difficult to measure in the field and behavioural studies of caged individuals has limited applications to wild populations. Nevertheless, evidence suggests that behavioural responses are expected to be temporary only (i.e. time taken for the vessel to pass).

The spawning periods of a number of pelagic and demersal species may overlap with the acquisition period (from April onwards), in addition to aggregation periods and/or migratory periods. Spawning areas of most species are unknown but likely to occur in sheltered areas of high productivity, such as the Kangaroo Island canyons and Bonney Upwelling. Without detailed knowledge of the spawning

areas it is difficult to reliably assess the amount of overlap between the spawning areas and the proposed activity. Nevertheless, any behavioural impacts which may occur will be temporary only and given the survey vessel is constantly moving along widely spaced sail lines, are unlikely to lead to long term impacts at the population level.

The survey area overlaps with areas of the white shark foraging BIA. These areas largely overlap with distribution of their preferred food source (sea lions) and therefore will be most common in areas where sea lions are found. Behavioural impacts to sharks (as discussed above) or the key prey (see 'Disturbance to pinnipeds below) are not expected to be significant. Furthermore, the DoE's species report card assesses noise pollution of less or no concern to the white shark, and therefore significant impacts at the individual or population level are not expected.

4.6 Disturbance to Spheniscidae/Birds

The majority of birds in the region will not be submerged for a prolonged period of time, and so impacts from the seismic survey are considered negligible, however little penguins can forage up to 20 minutes under water.

It is regularly documented that the hearing range of penguins is limited and that they are more likely to use their acute eyesight which are adapted for both air and water to hunt for prey in the ocean (SCAR, 2002).

Despite the apparent insensitivity of penguins to sound (Wever *et al*., 1969), these birds are known to respond to underwater vocalisations of predators (Frost *et al*., 1975) and, as such may be indirectly impacted by acoustic emissions through increased predation.

Overlap with Spheniscidae critical habitat

The northern part of the proposed survey area overlaps with the little penguin (*Eudyptula minor*) foraging Biological Important Area (BIA) and is relatively close to onshore breeding BIA locations. However, the BIA is restricted to the nearshore area around the Eyre Peninsula where only a relatively small area is overlapped by the survey area. Given the survey schedule, it is unlikely the survey vessel will be operating in the vicinity of the little penguin foraging BIA or sail line AU3-6600 during the breeding season when presence in the area is greatest (October – January). Furthermore, given the lack of significant impacts described above, the presence of the survey vessel is unlikely to lead to adverse impacts at the individual or population level.

4.7 Disturbance to Marine Turtles

It has been speculated that migrating turtles may use various acoustic cues and that acoustic disturbances might interfere with their navigational ability (McCauley, 1994). The auditory sensitivity of marine turtles is reported to be centered in the 400 to 1,000 Hz range, with a rapid drop-off in noise perception on either side of this range (Richardson *et al.*, 1995).

McCauley *et al.* (2003) concluded that turtles would, in general, show behavioural responses at two kilometres (at ~166 dB re 1 µPa (rms)) and avoidance behaviour at one kilometre (at ~166 dB re 1 µPa (rms)) from seismic acoustic source. However, they also noted that such rules of thumb for acoustic sources with frequencies within the range of turtle hearing (<1 kHz), cannot be reliably applied to shallow coastal waters near reefs, islands and nesting beaches, where transmission losses are typically much higher than in deeper, open water areas.

Marine turtles may possibly be exposed to noise levels sufficient to cause temporary threshold shift (TTS) should a seismic source start suddenly with turtles nearby (less than 30 m). In circumstances where seismic sources are already operating, (i.e. as a vessel moves along a pre-determined survey line), individuals would be expected to implement avoidance measures before entering ranges at which physical damage might take place.

Overlap with Marine Reptiles and Peak Activity

While there are no known turtle nesting, feeding or aggregating sites in the survey area, loggerhead, green, hawksbill and leatherback turtles could potentially transit through the survey area. It is expected that individuals transiting the survey area will take evasive action before sound levels are great enough to cause physical damage. As such, impacts from acoustic disturbance to loggerhead, green, hawksbill and leatherback turtle are not anticipated as a result of the survey.

4.8 Disturbance to Cetaceans

Cetaceans are sensitive to sound in the marine environment. Underwater noise can affect marine fauna in three main ways:

- Injury to hearing or other organs, where hearing loss may be temporary or permanent.
- Masking or interfering with other biologically important sounds.
- Disturbance leading to behavioural changes or displacement of fauna.

Thresholds above which injury may occur are reported between 198 dB re 1µPa and 240 dB re 1µPa (Gausland, 2000; Southall et al., 2007) which would occur only within a few metres of the seismic source and are therefore considered very unlikely.

The threshold of 160dB re 1µPa2.s has been adopted as the acoustic level whereby damage to whales may occur based upon EPBC Policy Guidelines 2.1 - Interaction between offshore seismic exploration and whales. Based on the modelling examples of predicted sound attenuation and sound exposure levels (Figure 4-1 & Figure 4-2), sound exposure levels of 160dB re 1µPa2.s are not expected outside of 10-20km from the source. Potential behavioural impacts to marine mammals from the seismic operations will be temporary and on an individual level and will be reduced to ALARP by implementing the mitigation measures outlined in Table 5-1.

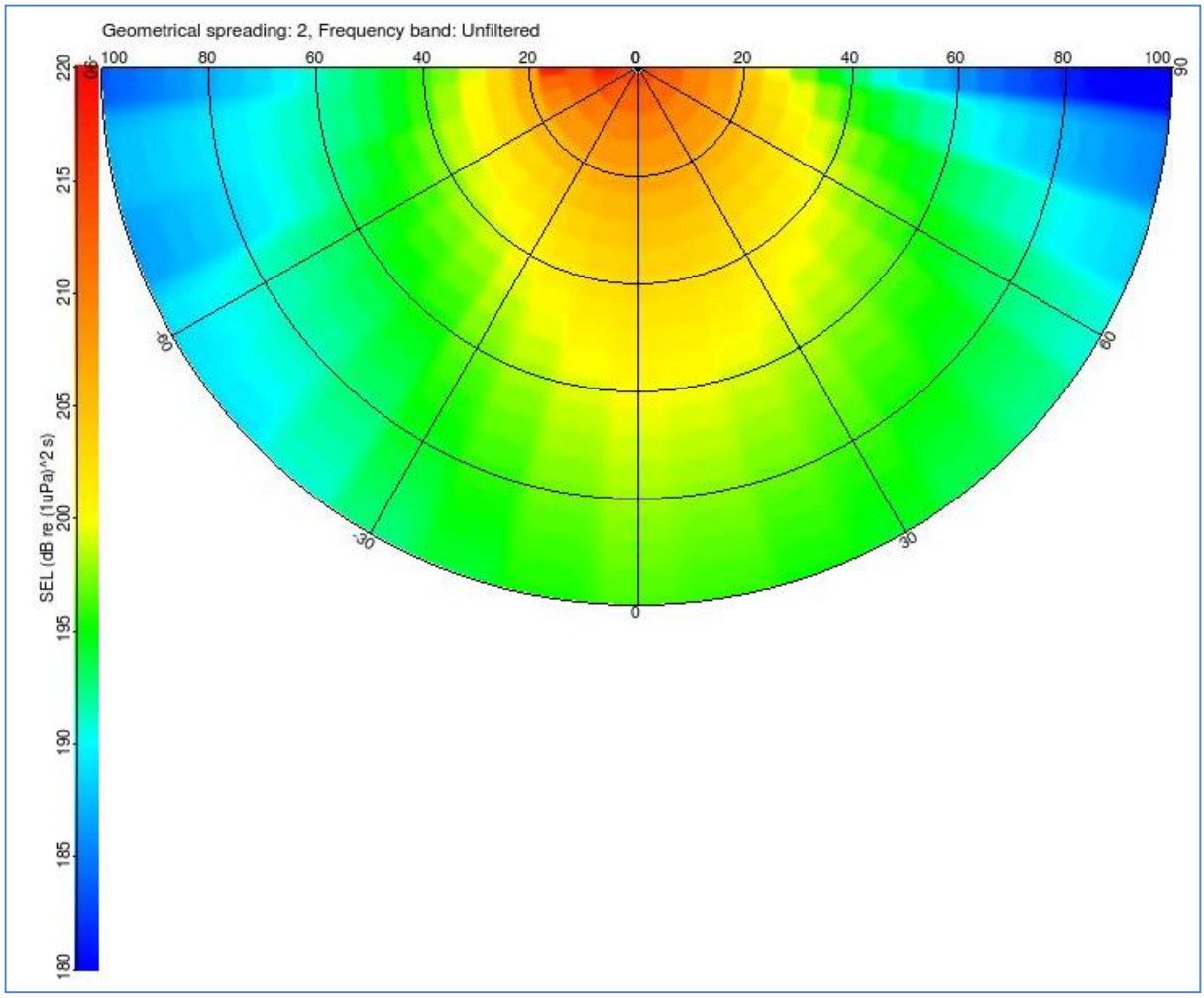

Figure 4-1: Polar plot of Sound Exposure Level (SEL) attenuation versus distance from airgun array for 6300 cubic inch source. Horizontal scale is distance from source (0 to 100m). The radial scale is angle from vertical (-90 to 90 degrees). This plot also strengthens the argument that the source focuses energy downward as opposed to laterally.

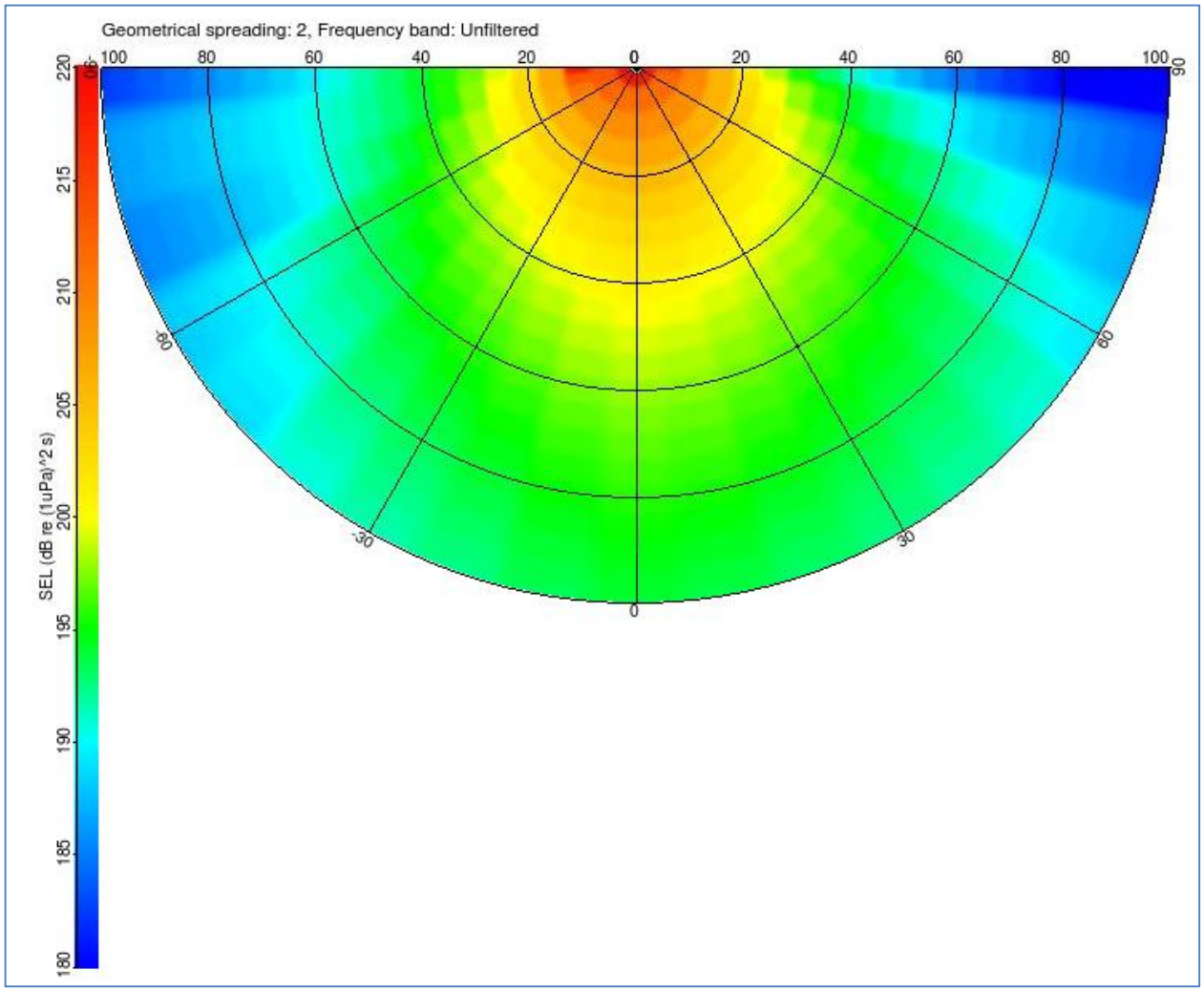

Figure 4-2: Polar plot of SEL attenuation versus distance from airgun array for 4750 cubic inch source (one sub-array of 6300 source disabled). Horizontal scale is distance from source (0 to 100m). The radial scale is angle from vertical (-90 to 90 degrees). This plot also strengthens the argument that the source focuses energy downward as opposed to laterally.

Baleen whales

Sound associated with seismic sources used during seismic surveys can cause significant behavioural changes in whales (McCauley, 1994). Behavioural responses to sound include swimming away from the source, rapid swimming on the surface and breaching (McCauley *et al.*, 2003). The level of sound at which response is elicited varies between species and even between individuals within a species (Richardson *et al.*, 1995).

McCauley *et al.* (2003) has drawn the following conclusions were drawn from his research about the effects of seismic survey sounds on humpback whales in the Exmouth Gulf region of WA:

- Only localised avoidance was seen by migrating whales during the seismic operation, indicating that the 'risk factor' associated with the seismic survey was confined to a comparatively short period and small range displacement.
- Coupled with the fact that humpback whales were seen to be actively utilising the 'sound shadow' near the surface, then it is unlikely that animals will be at any physiological risk unless at very short range from a large seismic source array.

- Upper levels of sound at 1.5 km from the seismic survey array are in the order of 182 dB re 1µPa^2, which is still well below the source levels of the highest components of humpback whale song (192 dB re 1µPa^2). Thus at 1.5 km the received seismic source signal is still well within the range which humpback whales would be expected to cope with physiologically, since it would be difficult to argue that humpback whale song can cause physiological problems to the animals (McCauley *et al.*, 2003).

While it is known that baleen whales will avoid operating seismic vessels, the distance over which the avoidance occurs seems to be highly variable between species and even within species (Richardson *et al*., 1995; McCauley *et al*., 1998), depending upon the activity of the individual. It is considered that this avoidance behaviour represents only temporary and minor effect on either the individual or the species unless avoidance results in displacement of whales from breeding, resting or feeding areas.

Toothed whales (including beaked whales)

There is limited systematic data on the behavioural response of toothed whales to seismic surveys. Richardson *et al*. (1995) reports that sperm whales appeared to react by moving away from surveys and ceasing to call even at great distances from a survey. However, a recent study supported by the US Minerals Management Service (Jochens and Biggs, 2003) indicated that there was no indication that the whales showed horizontal avoidance of the seismic vessel nor was there any detected change in feeding rates of the tagged sperm whales.

Stone and Tasker (2006) observed that during active seismic surveying, all small toothed whales, killer whales, and all baleen whales were found at greater distances from the seismic vessel than when it was not shooting. Small baleen whales showed the greatest horizontal avoidance, which reached to the limit of visual observation. Sighting rates for toothed whales, sperm whales, and killer whales did not decrease when airguns were off vs. on, however toothed whales and killer whales were found to be more susceptible to localized avoidance behaviour.

Overlap with Critical Cetacean Habitat and Peak Periods of Activity

Areas of peak cetacean activity or aggregation overlapping with survey area/wider environment include:

- Kangaroo Island canyons – includes blue whale and sperm whale BIA for foraging/possible foraging/migration
- Bonny upwelling
- West TAS canyons
- East New South Wales (NSW)/TAS – humpback migration corridor
- SA coast – southern right whale BIA

ION will plan their survey schedule to avoid the specific cetacean BIAs, their peak feeding time and peak migration period.

Given the potential overlap of the survey area with foraging areas of the sperm, blue and sei whale, these cetaceans undertaking behaviours critical to the species life history may be encountered within the survey area during data acquisition. While individuals are likely to move away from the operating seismic vessel, avoiding physical damage to individuals, this behavioural response may displace individuals from critical habitat (e.g. foraging areas) and lead to a change of behavior (e.g. ceasing feeding) with negative impacts to the individual.

The survey vessel will be continually moving along pre-determined sail lines, and operations will only be present in locations for a limited amount of time (up a few days at most), furthermore the additional mitigation measures for all whale species (refer to Table 5-1). As such, any behavioural impacts are likely to be short term only, representing a relative small proportion of the time spent by individuals in the critical habitat (which generally spans several months). Any possible disturbance to marine mammals from underwater noise associated with the proposed survey will occur at the individuals and will not impact at a population level.

4.9 Disturbance to Pinnipeds

There is a lack of information on the effects of seismic operations on pinnipeds, especially in Australian waters (Pidcock *et al.*, 2003). It has also been measured that pinnipeds have a high tolerance to strong sound pulses from nearby seismic vessels.

Harris *et al.,* (2001) studied the behaviour of seals during a near-shore seismic program in Alaska (1996). The study identified that there was partial avoidance of the vessel within 150m during full–array seismic acquisition, and the mammals did not move beyond 250m. Avoidance behaviour (swimming away) was observed for all seals (except one harbour seal) and grey seals were observed to change from making foraging dives to transiting dives. Pre-trial behaviour (i.e. foraging dives) was observed within two hours of airgun cessation.

Overlap with Critical Pinniped Habitat

Pinnipeds are highly mobile and opportunistic predators that utilise a wide range of benthic and pelagic foraging habitats within the Australian sealion BIA (overlapping with the survey area), and base their foraging strategies on prior experience and situational decision-making. On this basis, while localised acoustic source impacts may lead to changed behaviours and localised displacement, it is expected that foraging behaviours associated with pinnipeds will adapt and extend to areas beyond the area immediately affected by high sound levels (coincidently accommodating temporarily displaced species). Furthermore, the frequency of sound created during seismic surveys is generally considered to be outside of the hearing range of sea lions, and therefore any individuals encountered during the survey are unlikely to be impacted by the seismic activity. Acoustic impacts to pinniped foraging behaviour is therefore not expected to be significant and should not impact upon the ecological functioning of the BIA and wider foraging habitats.

4.10 Cumulative impacts of two simultaneously operating seismic vessels

The simultaneous operation of two seismic vessels or the repeated use of seismic airguns over the same area (when seismic lines intersect for example), may lead to increased cumulative noise energy that could increase risk of underwater noise impacts to marine fauna.

When assessing potential cumulative impacts of seismic surveys it is important to bear in mind that the potential impacts will not occur over the entire survey area or for the duration of the survey, since the survey vessels are constantly moving while acquiring data. In the worst case scenario, two vessels may temporarily (i.e. minutes or hours at most) be within a distance of one another such that a larger area is impacted by elevated sound exposure levels. The survey vessel will travel distances up to 187 km/day, minimizing prolonged exposure in any given area and any cumulative impacts are expected to be temporary.

5 ENVIRONMENTAL HAZARDS AND PERFORMANCE STANDARDS

The environmental risks and potential environmental impacts of the proposed survey have been determined on the basis of ION's previous seismic survey experience in Australian waters and the outcomes of a risk assessment (Table 5-1). The risk assessment methodology applied is consistent with the Australian/New Zealand Standard AS/NZS ISO 31000:2009 Risk management - Principles and Guidelines, Handbook HB 203:2012 Managing Environment – Related Risk, and Handbook HB 89-2012 Risk Management – Guidelines on Risk Assessment Techniques.

5.1 Practicability Assessment

While reducing potential impacts associated with a particular risk, implementation of a specific control measure may require additional costs or effort, may lead to timing or operational constraints, or potentially pose different risks to another aspect of the environment. In assessing practicability of control measures, these negative aspects (cost, effort, timing/ operational restrictions and additional environmental and/or safety risks) are weighed against the environmental benefit of implementing the control measure. Should the benefit outweigh the negatives, the control measure is implemented.

5.2 Demonstrating ALARP

Determination that an impact or risk is reduced to ALARP is a process which factors in a range of environmental and operational considerations. The key stages in determining ALARP are as follows:

- Application of design and construction codes and standards and good industry practice
- Early identification of hazards and implementation of the recommendations to eliminate risk through design, procedures and practices
- Identification of the key risk drivers qualitatively or quantitatively
- Identification of all possible risk reduction (control) measures
- Assessment of the practicability and cost benefit of each risk reduction measure (see below)

To demonstrate that an ALARP assessment has been undertaken for each of the environmental hazards identified, the 'Hierarchy of Control', commonly used in safety systems, has been adopted. In descending order of effectiveness, the hierarchy of control criteria is:

- Eliminate – remove the risk
- Substitute – change the risk for a lower risk
- Engineering – engineer out the risk
- Isolation – isolate people or the environment from the risk
- Administrative – provide instructions or training to people to lower the risk
- Protective – use of protective equipment

5.3 Demonstrating Acceptability

Following assessment of control measures for practicability, the risk will be deemed ALARP and assigned a residual risk ranking. The residual risk is then assessed to determine whether it is at an environmentally acceptable level. In determining acceptability, the level of impact and risk to the environment is considered using the following criteria:

- Residual risk ranking level is Low-Medium
- Principles of ecologically sustainable development (ESD, see below)
- Legal and regulatory requirements (including laws, policies, standards, conventions)
- Internal context e.g. consistent with titleholder policy, culture and company standards)
- External context such as stakeholder expectations
- ALARP demonstration (as described above)

If all these criteria are met, the risk is considered acceptable with all control measures implemented.

5.4 Summary of Environmental Risk Assessment Results

The risk assessment indicates that the potential impacts arising for the proposed survey can be categorised as having Low or Medium risk levels. No risks were assessed as High.

A summary of the key sources of environmental risk (aspects) for the proposed activity include:

- Discharge of underwater seismic pulses
- Light generation from vessels
- Interactions of vessel movements with marine fauna
- Anchoring or grounding of vessels used for the activity
- Dragging or loss of cables, cable fluid and associated equipment
- Emissions to atmosphere from vessels
- Discharge of ballast water and vessel biological fouling
- Routine discharge of wastewater and waste to ocean from survey and support vessels
- Accidental discharge of hydrocarbons and chemicals to ocean from survey and support vessels
- Vessel collisions resulting in hydrocarbon spills, and/or damage to benthic habitats ;
- Interactions with commercial fishing, shipping and defence activities
- Operation of the survey and support vessels within, or in the vicinity of, protected and heritage areas

A summary of the potential environmental impacts associated with the above sources of environmental risk include:

- Disturbance and /or injury/mortality to marine fauna including cetaceans, turtles and fish
- Disturbance to the seabed and benthic habitats and communities
- Reduced air quality from atmospheric emissions as a result of operation of machinery and use of internal combustion engines
- Introduction of invasive marine species as a result of ballast water discharge and vessel biological fouling
- Marine pollution from routine discharges including sewage, grey water, bilge water and other putrescible wastes (i.e. food scraps)

- Marine pollution from accidental discharges including spills of hydrocarbons and hazardous materials
- Disturbance to social and community values due to interactions with commercial fishing vessels and shipping
- Disturbance to heritage and conservation values due to operation of vessels within, or in the vicinity of, protected areas

The environmental aspects of the survey that have the potential to cause significant environmental effects (assessed as Medium) have been determined through an evaluation of the proposed activity, the surrounding environment including specific sensitivities and values, and legislative requirements. These environmental aspects are:

- Introduction of invasive marine species
- Hydrocarbon spills

The next section describes the potential environmental impacts identified and the mitigation and management measures that will be implemented to ensure that the potential adverse environmental impacts are managed to acceptable levels.

Table 5-1: Summary of the environmental risk assessment and controls

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
Disturbance to marine fauna	Discharge of underwater seismic pulses	Physical injury/disturbance to marine fauna	Low	Seismic survey operations conducted in accordance with EPBC Act Policy Statement 2.1 – Part A Standard Management Procedures for all species of whale: • Continuous observations • Precautionary zones: ➢ observation zone: 3 km+ ➢ low power zone: 2 km ➢ shutdown zone: 500 m • Use of soft starts on every occasion • Recommencement procedures in good visibility, low visibility and night time (Figure 5-1)
				In periods of low visibility / night time, commencement restrictions will be adhered to as defined in survey acquisition plan for all species of whale: Recommencement procedures in good visibility, low visibility and night time (Figure 5-1) • During times of low visibility/night time, low power will be in operation at all times (unless whale enters within shutdown zone of 500 m). During the event of line turns or maintenance, one gun will be emitted, to act as a warning signal and avoidance mechanism for marine fauna.
				As per EPBC Act Policy Statement 2.1 –Part B Additional Management Procedures for the duration of survey two trained MFOs will be used
				Relevant personnel (including MFOs) trained in application of EPBC Policy Statement 2.1
				Survey Party Chief will continually assess the source size is appropriate for the geological output (maximum source size 6,300 cui) and will be reduced if possible to maintain survey objectives.

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				All survey vessel crew (i.e. MFOs, marine, deck and bridge crew) attend environmental induction which includes EPBC Policy statement
				Operations Manager and Survey Party Chief ensure data acquisition will only occur between November and May
				Adaptive management framework implemented in the event of encountering increased numbers of whales for all species (Figure 5-2).
				PAM utilised at all times throughout survey Should a whale detection occur through PAM, EPBC Policy Statement 2.1 precautionary zones will be adhered to for all whale species during low visibility and night time operations • Continuous detection • Precautionary zones used in PAM: ➢ observation zone: 3 km+ ➢ low power zone: 2 km ➢ shutdown zone: 500 m • Use of soft starts on every occasion Recommencement procedures (Figure 5-1)
				The Survey Party Chief ensures 1 of the 4 sub-arrays will be switched off in water depths less than 50 m (please refer to Figure 4-2)
				ION will avoid humpback whale migration routes in the eastern part of the survey during sensitive timings where possible: • April – May on the northward migration; and • November – December during the southward migration

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				ION will avoid BIA and feeding upwelling areas (Bonney Coast upwelling and Kangaroo Island canyons) for blue whales during the peak feeding timing between December and February, where possible. No acquisition will occur within the blue whale BIA or the Kangaroo Island canyons or Bonney Coast during February.
				ION will continually assess areas in which ION can contribute to scientific research and assess all new scientific data made available in the survey area and in relation to seismic acquisition.
				Vessel master ensures that no acquisition occurs within little penguin BIAs or along sail line AU3-6600 or AUS-0900 from Oct 1 – Jan 30
				Vessel master ensures that no acquisition within BIAs for southern right whales
				Vessel master ensures that no acquisition within 70 km of southern right whale breeding identified in May
				Vessel master ensures that acquisition does not occur in peak sperm whale feeding periods (August – September)
				Communications with other survey vessels to ensure simultaneous operating survey vessels will not pass within at least 40 km of one another
				ION will not intersect a 2D acquisition sail line (from their own survey) within 5 hours
				ION will not exceed a total of 3 2D acquisition sail line intersections (from their own survey) within any 1 km^2 area in the proposed survey area
				Seismic source will be shut down in State waters
Disturbance to marine fauna	Light generation from vessels	Behavioural effects on marine fauna	Low	Survey Party Chief ensures vessel lighting procedures adhered to which include ensuring lighting kept to minimum for navigation, vessel safety and safety of deck operations in accordance with Navigation Act 2012 (or equivalent) i.e., the minimum required to ensure safe navigation and operation
				All survey vessel crew (i.e. MFOs, marine, deck and bridge crew) attend environmental induction

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
Disturbance to marine fauna	Vessel movements	Physical injury/disturbance to marine fauna	Low	Vessels Masters ensure vessels operate in accordance with Part 8 of EPBC Regulations: • at a constant speed of less than 6 knots, away from a cetacean that is approaching so that the vessel remains at least 300 metres away from the cetacean • must not approach closer than 300 metres to a cetacean
				All survey vessel crew (i.e. MFOs, marine, deck and bridge crew) attend environmental induction which includes requirements of EPBC Regulations (Part 8)
				Source will be shut down in State waters
				Vessel master ensures that acquisition does not occur in peak sperm whale foraging periods (August – September)
Physical disturbance to benthic habitats	Deployment and retrieval of anchors	Localised physical damage to benthic habitats, and associated fauna	Low	Survey Party Chief ensures anchoring only occurs in event of an emergency
				ION will ensure that vessels with DPS are utilised during the survey
	Vessel grounding		Low	ION ensures vessels equipped with an automatic identification system (AIS) and an ARPA system which can identify, track and project the closest approach for any vessel (time and location) within the operational area and radar range (<70 km away).
				Navigation equipment and vessel procedures compliant with all marine navigation and vessel safety requirements under the *International Convention of the Safety of Life at Sea* (SOLAS) 1974 and *Navigation Act 2012* (or equivalent).
				The vessel master will ensure the survey vessel will only operate in water depths >30 m
	Equipment damage, dragging		Low	Survey party chief ensures that dropped objects/ lost in water equipment recovered where possible and records maintained, following relevant procedures and JHAs.

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
	or loss			Recording / reporting of incidents involving loss of equipment (e.g. cable loss)
				Survey Party Chief ensures streamers are fitted with self inflating buoys prior to deployment.
Atmospheric emissions	Operation of machinery and vessels powered by internal combustion engines	Localised reduction air quality Greenhouse gas emissions	Low	Survey Party Chief ensures compliance with Protection of the Sea (Prevention of Pollution from Ships) Act (PSPPS Act) and Marine Orders – Part 97: Marine pollution prevention – air pollution by ensuring vessel has valid and current IAPPC
				Vessel Master ensures optimisation of fuel use to increase efficiency and minimise emissions through: • planned maintenance of engines • maintenance of steady speed and course of vessels • course plotting to minimise survey duration / emissions • helicopter routing optimised by service provider to minimise flight times; use for essential activities e.g. crew change, medivac only
				Survey party chief ensures sulphur content of fuel oil complies with Regulation 14 of MARPOL Annex VI in order to control SO_X and particulate matter emissions
				Vessel master ensures emission producing equipment including engines are maintained to maximise efficiency
				Survey Party Chief ensures incinerators used are compliant with MARPOL and IMO requirements
				Survey Party Chief ensures incinerators will be operated in accordance with manufacturers specifications by trained personnel
Invasive marine species	Discharge of ballast water from vessels	Introduction and establishment of IMS and displacement of native marine species	Medium	Ballast water will be discharged in line with a Vessel Ballast Management Plan
				Vessel Ballast Management Plan will be compliant with Australian Ballast Water Management Requirements (e.g. ballast changes in open ocean >200m deep)
	Biofouling of		Medium	Prior to survey commencing, both survey and support vessels have all necessary DoA

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
	vessel hulls, other niches and immersible equipment			clearances to operate unrestricted anywhere in Australian waters
				National biofouling management guidance for the petroleum production and exploration industry is adhered to including: Vessel risk assessment conducted for all vessels (international or domestic) to determine risk level of vessel – if moderate/uncertain outcome further mitigation required: • In-water inspection • Hull cleaning carried out if inspection discovers invasive/non-native species Antifoulant paint reapplied in line with manufacturers specifications
				Survey Party Chief ensures reporting of known or suspected introduced species to FishWatch by phone (1800 815 507).
Marine pollution from routine discharges	Discharge of sewage, grey water and putrescible wastes	Localised reduction in water quality due to nutrient enrichment	Low	Vessel master ensures that: • Sewage and putrescible wastes macerated prior to disposal • Sewage discharged >3 nm from land for treated sewage; >12 nm from land for untreated sewage
				• Vessel master ensures adherence to Marine Orders – Part 96 which includes: • discharge of sewage and putrescibles waste will be of short duration with high dispersion and biodegradability; • all sewage and putrescible waste treatment systems and holding tanks are inspected prior to survey commencement; and • survey on-board sewage treatment plant approved by the International Maritime Organisation (IMO)
				Survey Party Chief will ensure crew use biodegradable soaps and detergents (where possible) if support vessel is unable to treat/store grey water (i.e. wastewater from sinks and showers)
				Vessel Master ensures Vessel Waste Log is maintained to record waste management

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				practices
	Discharge of bilge water	Acute toxicity effects on marine fauna and flora Localised reduction in water quality	Low	Vessel Master ensures a current and valid IOPPC on vessels
				Vessel master ensures that OIW measured prior to discharge of bilge water, if >15ppm then containment and onshore disposal of bilge water contaminated with hydrocarbons will occur,
				Vessel master ensures there is provision of appropriate segregation facilities on survey and support vessel, including tanks for storage of bilge water
				Vessel procedures include requirement that bilge water contaminated with chemicals must be contained and disposed of onshore, except if the chemical is demonstrated to have a low toxicity (as determined by the relevant Material Safety Data Sheet [MSDS])
Marine pollution from accidental discharges	Discharge of solid wastes i.e. garbage	Toxic effects on marine fauna and flora Localised reduction in water quality Indirect effects on commercial fisheries Disturbance to marine fauna or habitats Physical impacts on marine fauna i.e. from plastics	Low	Vessel master ensures compliance with PSPPS Act and Marine Orders – Part 95: Marine Pollution Prevention – Garbage
				Vessel master ensures no discharge of plastics or plastic products of any kind from survey and support vessels
				Vessel procedures state no discharge of domestic wastes (i.e. cans, glass, paper or other wastes from living areas) and no maintenance wastes (i.e. paint sweepings, rags, deck sweepings, oil soaks, machinery deposits, will be disposed of overboard) from vessels
				Garbage management plan requires that all waste receptacles aboard survey and support vessels covered with tightly fitting, secure lids to prevent any solid wastes from blowing overboard
				Garbage management plan requires that all solid, liquid and hazardous wastes (other than sewage, grey water and putrescible wastes) incinerated or compacted (if possible), stored in designated areas and sent ashore for recycling, disposal or treatment (consignment manifests available)

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Survey Party Chief ensures that incinerators are compliant with MARPOL and are maintained in accordance with manufacturers specifications and operated only by trained personnel
				Correct segregation of solid and hazardous wastes / good housekeeping evident
				Vessel master ensures Vessel Waste Log is maintained to record quantities of wastes transported onshore, and detailed records of waste accidentally discharged
Marine pollution from accidental discharges	Hazardous materials	Toxic effects on marine fauna and flora Localised reduction in water quality Indirect effects on commercial fisheries Disturbance to marine fauna or habitats	Low	Vessel master ensures compliance with PSPPS Act and Marine Orders - Part 94: Marine Pollution Prevention - Packaged Harmful Substances
				Survey Party Chief ensures all chemical and hazardous materials will be segregated into clearly marked containers prior to onshore disposal / good housekeeping evident
				Survey Party Chief ensures MSDS readily available for all hazardous substances aboard survey and support vessels
				Garbage management plan requires that all waste receptacles aboard survey and support vessels covered with tightly fitting, secure lids to prevent any hazardous materials from blowing overboard
				SOPEP implemented and tested for survey and support vessels prior to commencing the survey. This test will involve a vessel based drill and testing of communications for notifying the RCC, at or near the survey location prior to the activity. At least one additional vessel based drill will be undertaken during the survey
				Spill response bins/kits located in close proximity to hydrocarbon storage areas for prompt response in the event of a spill or leak and replenished if required
				Kits checked during vessel audits for their adequacy and replenished as necessary.
				Training records show identified personnel are trained and competent in spill response procedures and equipment

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Survey Party Chief ensures that incinerators are compliant with MARPOL and are maintained in accordance with manufacturers specifications and operated only by trained personnel
Marine pollution from accidental discharges	Hydrocarbon spills	Localised chronic/acute toxicity effects on marine organisms Localised reduction in water quality Indirect effects on commercial fisheries Disturbance to marine fauna or habitats	Medium	Information provided to AMSA, SA DPTI, VIC DTPLI and TAS EPA arrival and departure so that the maritime industry is aware of petroleum activities
				Bulk liquids transferred in accordance with the bulk transfer procedures to reduce the risk of a release to sea. The procedures will require: • Hose integrity: certified hoses replaced after 12 months of use • Hose flotation: bulk hoses in the water fitted with floatation collars. • Supervision: dedicated hose watch person while pumping bulk product. • Communications: constant radio communications between hose watch person and vessel. • Emergency shutdown: vessel emergency pumping stop tested before each transfer operation
				Prior to contract finalisation, ION will ensure survey vessel and support vessels have navigation systems such as: ECDIS, AIS, radar, GPS, and depth sounders to aid in detection at sea
				Navigation equipment and vessel procedures compliant with all marine navigation and vessel safety requirements under the *International Convention of the Safety of Life at Sea* (SOLAS) 1974 and *Navigation Act 2012* (or equivalent), including Marine Orders – Part 30: Prevention of collisions and COLREGS
				Inspections confirm that any hydrocarbons located above deck with secondary containment
				Vessel manager ensures SOPEP implemented and tested for survey and support vessels prior to commencing the survey. This test will involve a vessel based drill and testing of communications for notifying the RCC, at or near the survey location prior to the activity. At least one additional vessel based drill will be undertaken during the surveys

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Vessel master ensures that only MGO is stored on or bunkered to vessels, no HFO utililsed on survey or support vessels
				Inspections/audits confirm that spill response bins/kits located in close proximity to hydrocarbon storage areas for prompt response in the event of a spill or leak and replenished if required
				Survey Party Chief ensures kits checked prior to vessel departing, during vessel audit/inspection for their adequacy and replenished as necessary.
				Training records show identified personnel are trained and competent in spill response procedures and equipment
				Attendance records show all crew have attended an environmental induction containing basic information on spill response measures (i.e. MFOs, marine, deck and bridge crew)
				Vessel master ensures that refuelling does not occur in proximity to any emergent feature/shoreline (< 11 km)
				Vessel master ensures that the survey vessel will not approach within 1 km of the Twelve Apostles Marine National Park
				The Survey Party Chief will ensure the Streamer Deployment and Recovery Procedure (AQU-WIS-0007) is followed
Marine pollution from accidental discharges	Oil spill response	Additional vessel and helicopter traffic and associated emissions, exhaust gases, noise and light, generation of waste contaminated	Low	Vessel Master ensures survey vessel SOPEP in place on-board vessel
				Training records demonstrate crew are trained and competent in SOPEP implementation
				Operations Manager ensures that implementation of NATPLAN by AMSA and NATPLAN, SAMSCAP, VicPlan and TASPLAN by relevant state Control Agencies in the

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
		with MGO, and inappropriate management of oil contaminated flora, fauna and surfaces.		event of a spill
				Operations Manager ensures waste management occurs in accordance with NATPLAN, SAMSCAP, VicPlan and/or TASPLAN
				Survey Party Chief ensures spills are reported to AMSA and relevant state Control Agencies without delay
				Oil spill drills completed as per procedures
				Operations Manager liaises (at intervals commensurate with the nature and extent of the incident) with parties involved in emergency response to evaluate effectiveness of response (and determine the occurrence of any impacts); these may include: • Site Representative • AMSA, and relevant state Control Agencies
				Operations Manager ensures consultation undertaken prior to the survey and notices issued (where applicable) with relevant stakeholders including: • Commercial fisheries • Management agencies • Industry bodies • Individual companies
				Operations Manager ensures information provided to AMSA, SA DPTI, VIC DTPLI and TAS EPA detailing vessel arrival and departure in area so that the maritime industry is aware of petroleum activities
				Operations Manager ensures insurance policies in place to cover any post spill environmental monitoring or clean up post spill prior to survey commencement

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				The Site Representative conducts a Post-incident review to identify lessons learned
				Operations Manager ensures SMP implemented in Commonwealth waters in accordance with Section 7.7.2
Disturbance to other users of the sea	Commercial fisheries, Commercial shipping Petroleum exploration and production	Direct or indirect impacts on target species Loss of access to an area Navigational hazards (survey vessel and towed array) Potential loss of equipment Collision risk	Low	Navigation equipment and vessel procedures compliant with all marine navigation and vessel safety requirements under the *International Convention of the Safety of Life at Sea* (SOLAS) 1974 and *Navigation Act 2012* (or equivalent), including Marine Orders – Part 30: Prevention of collisions and COLREGS.
				Vessel navigational equipment, procedures are utilised to prevent risk of spills, e.g. Vessels equipped with multiple means of communication, bathymetric charts, vessel detection; daily notification of position to RCC; vessel exclusion zone applied.
				Operations Manager ensures personnel are Trained and competent to ensure communication between vessels during survey
				Operations Manager ensures that consultation undertaken one month prior to any activity commencing in each phase. Notices issued (where applicable) with relevant stakeholders including AMSA to determine level of commercial shipping in vicinity of survey area, oil and gas operations, DoD and associated activities: • Commercial fisheries • Management agencies • DoD • Industry bodies • Individual companies
				Operations Manager ensures compliance with AMSA administered marine safety regulations and marine notification requirements, i.e. SITREPs at the start and completion of works.

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Vessel Master ensures at least one support vessel accompanies the survey vessel to manage interactions with other shipping to prevent / manage vessel interactions; multiple means of communication available.
				Vessel Master ensures vessel exclusion zone around the survey vessel is maintained.
				Vessel Master ensures other mariners alerted of vessels presence and extent of towed array through a display of appropriate navigational beacons and lights, radar watch, radio contact.
				Survey party chief ensures in-water equipment lost will be recovered (where possible) and reported.
				Survey Party Chief ensures no recreational fishing from survey or support vessels.
Disturbance to other users of the sea	Commercial fisheries, Commercial shipping Petroleum exploration and production	Direct or indirect impacts on target species Loss of access to an area Navigational hazards (survey vessel and towed array) Potential loss of equipment Collision risk	Low	Operations Manager ensures that notification of any seismic activity 3 months prior to seismic activities occurring sent to: • Submarine Operations, SUBOPS.SUBCON@defence.gov.au, • Joint Airspace Control Cell ADF.Airspace@defence.gov.au, • Australian Hydrographic Office hydro.ntm@defence.gov.au
				Operations manager will ensure ingress agreements will be signed by listed operator prior to seismic vessel entering permit area
				Vessel Master ensures acquisition will not occur west of Kangaroo Island between Oct 1 and March 20
				Vessel Master ensures sail line AU3-0950 will not be acquired between Oct 1 and March 31

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Vessel master will ensure will ensure vessel will stand down and move away from towing fishing vessels, maintaining at least 10 km separation distance to fishing vessels still operating after March 20
				Vessel Master ensures survey vessel will not operate within 10 km of a fishing vessel towing pontoons.
				Vessel Master ensures survey vessel will not operate in water depths < 50 m in known scallop grounds in TAS (and VIC if provided).
				Vessel Master ensures support vessel will scout ahead of survey vessel to identify any fishing equipment which may be located on the sail line.
				Fisherman Liaison Officer (FLO) will, with prior consent, ensures fishing equipment located on a sail line will be temporarily moved to avoid damage occurring.
				FLO will provide a local point of contact for fishermen and recreational divers enabling issues raised in the preparation for, or during, the proposed survey in a timely fashion and in person (if required).
				FLO will notify and engage with local diving centres
Disturbance to other users of the sea	Commercial fisheries, Commercial shipping Petroleum exploration and production	Direct or indirect impacts on target species Loss of access to an area Navigational hazards (survey vessel and towed array) Potential loss of equipment Collision risk	Low	Operations Manager will oversee the development of a publically accessible, survey-specific website providing stakeholders with daily updates of the vessel's location and planned movements for the following 24 and 72 hours.
				Operations Manager ensures compensation policy for equipment damage is in place prior to survey commencement.
				Vessel Master ensures seismic source is shut down in state waters.
				Vessel Master ensures the survey vessel will not operate within 40 km of other operating seismic survey vessels, or 50 km in the case of the Nerites survey vessel.

Hazard	Environmental aspect	Potential environmental impacts	Residual risk level	Risk Treatment Avoidance, mitigation and management controls
				Operations Manager ensures a stakeholder notification letter is circulated to relevant stakeholders (already consulted prior to the survey) 3 months prior to survey commencing (and any further subsequent phases) confirming details of: • Survey and support vessel names • Start date • FLO contact details • Website details • Confirmed survey area and sail lines • Intended acquisition schedule • Text messaging opt-in
				Operations Manager ensures notifications of other survey aspects, such as change in start date are sent to stakeholders
				The vessel master will ensure the survey vessel will only operate in water depths >30 m
Heritage and conservation values	Heritage and conservation values	Loss of access to an area Navigational hazards (survey vessel and towed array) Collision risk	Low	Site Representative (3rd Party QC) monitors compliance with the commitments in this EP including outcomes and performance standards e.g. through audits, inspections, and observation of working practices
				Training records demonstrate that all personnel (including MFOs, marine, deck and bridge crew) have participated in pre-survey environmental induction that includes description of environmental sensitivities and conservation values of survey area and surrounding waters
				Vessel Master will ensure survey vessel maintains a 1 km buffer of the Twelve Apostles Marine National Park

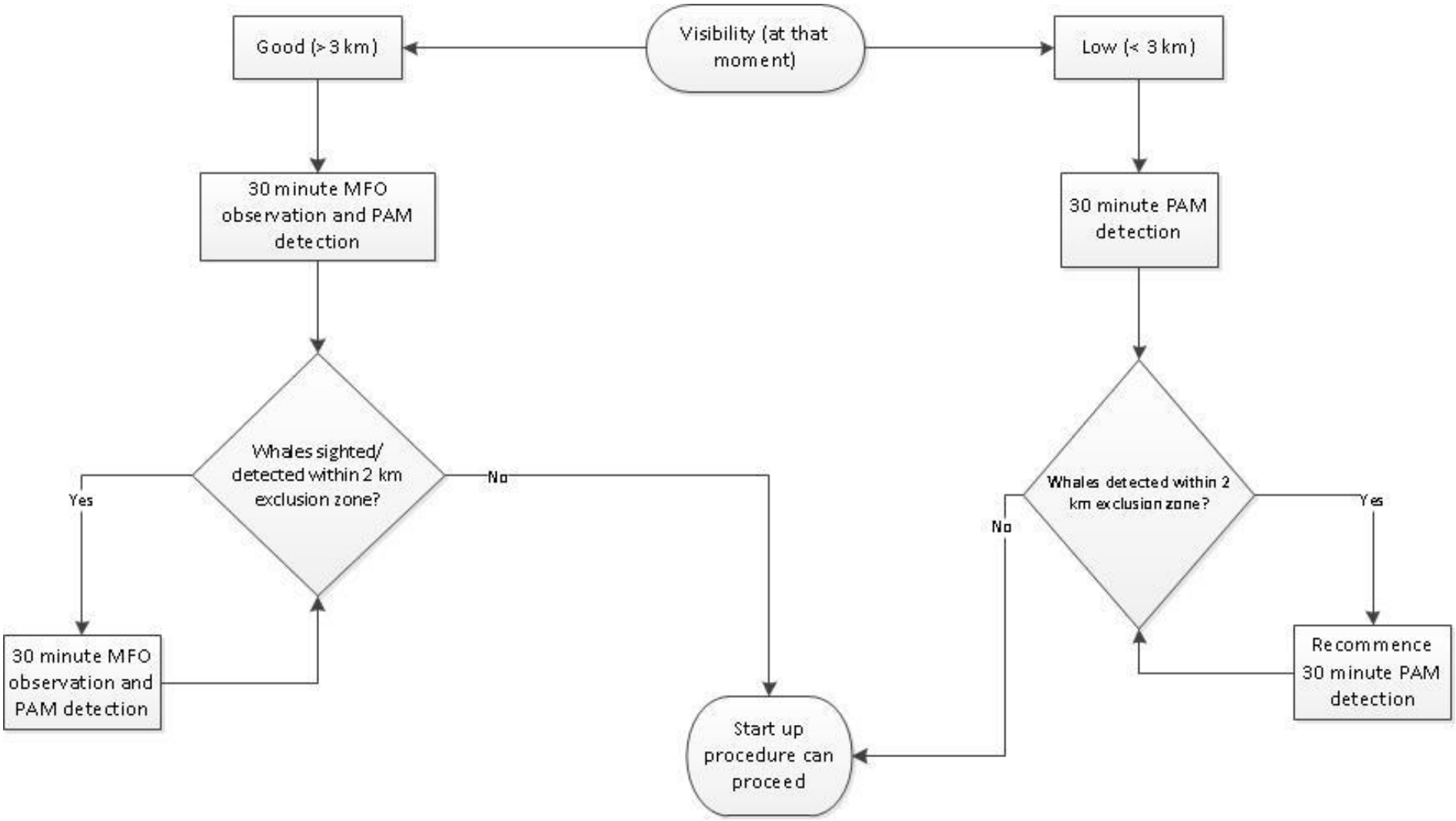

Figure 5-1: Recommencement procedure for seismic activity in good and poor (including night time) visibility

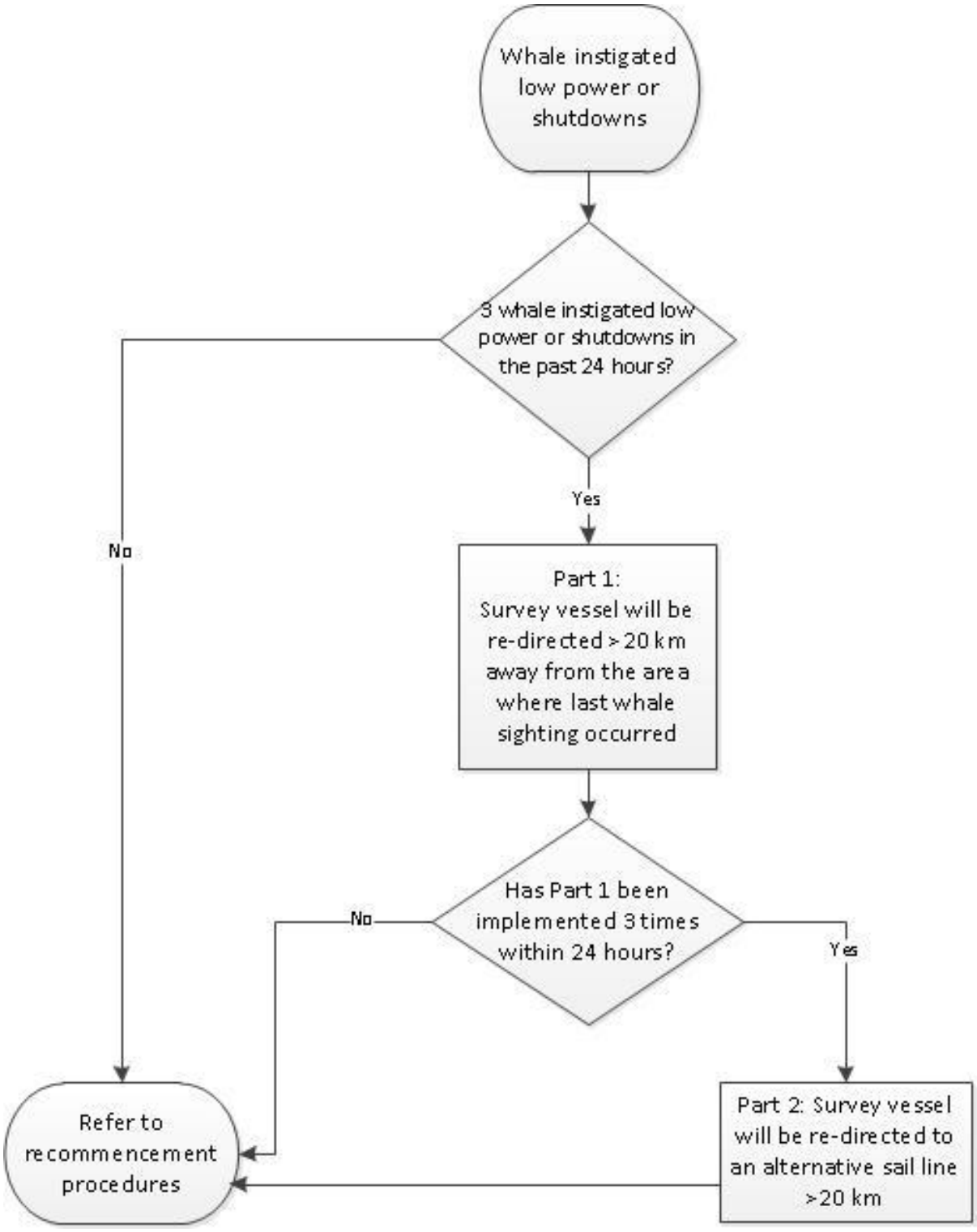

Figure 5-2: Adaptive management framework procedure for encountering increased numbers of whales

6 IMPLEMENTATION STRATEGY

The 2D seismic survey will be managed in compliance with all measures and controls detailed within the EP accepted by NOPSEMA under the OPGGS (E) Regulations, other environmental legislation and ION's Environment Management System (EMS).

The objective of the EP is to ensure that potential adverse environmental impacts associated with unplanned events and planned events associated with the survey, are identified and assessed, and to stipulate mitigation measures to avoid and/or reduce any adverse impacts to the environment to ALARP.

The EP details specific performance objectives, standards and procedures, and identifies the range of controls to be implemented (consistent with the standards) to achieve the performance outcomes. The controls for the survey activities are summarised in Section 5. The EP also identifies the specific measurement criteria and records to be kept to demonstrate the achievement of each performance outcome.

As described in the EP, the implementation strategy includes the following:

- Details on the EMS to be implemented;
- Key roles and responsibilities;
- Training and competencies;
- Monitoring and record keeping;
- Auditing;
- Management of non-conformance;
- Emergency response; and
- EP review

All personnel required to work on the survey and support vessels (i.e. Marine Fauna Officers (MFOs), marine, deck and bridge crew) will be given a Health Safety Environment (HSE) induction prior to the commencement of duties. All personnel who undertake the induction will be required to sign an attendance sheet which is retained by the ION Project Manager. All vessel-based personnel will be required to conform to all applicable guidelines and requirements for management of HSE issues. All crew onboard the vessel/s will be made aware of and will be required to become familiar with the requirements of both the contractor-specific environmental management systems as well as the EP during the activity induction process. In addition, project-specific Environment Plan (EP) requirements will be communicated to the vessel crew by the ION Site Representative.

Audits/inspections will consider both the implementation of controls as identified in the EP and the effectiveness of those controls in reducing the environmental impacts and meeting performance outcomes. Should any inadequacies or improvements be found, the EP will be amended via a Management of Change or revised EP to ensure environmental impacts and risks of the activity are continually identified and reduced to a level that is As Low As Reasonably Practicable (ALARP).

ION employees and contractors are required to report all environmental incidents and non-conformance with performance outcomes detailed in the EP.

Detailed investigations will be undertaken by ION for all high potential environmental incidents, and these investigations will include the ION Site Representative.

Upon identification of a potential new or increased environmental impact or risk, ION will conduct a review and risk assessment for the potential impact. Furthermore, 3 months prior to each phase ION will internally inspect and review for new or increased environmental impacts or risks that may have arose e.g. through stakeholder consultation, and review of EPBC Protected Matters Search and relevant published papers.

In addition to identification of new or increased environmental impacts or risks, a revision of the EP may be required should there be any changes in scope to the activities detailed in this EP (e.g. timing, location, methods). Under these circumstances, a risk assessment for the proposed change will be conducted.

Any changes to scope will be managed in accordance with the ION Management of Change under the responsibility of the Operations Manager to ensure that impacts and risks are continuously reduced to ALARP.

7 HYDROCARBON SPILL RESPONSE ARRANGEMENTS

The hazards associated with hydrocarbon spills during the survey (that are considered most credible) are:

- Seismic streamer fluid leak (~120 L per seismic cable section)
- On-deck leak or spill of small quantities (up to 50 litres) of hydraulic oil or lubricating oil
- Refuelling spills (typically less than 1 m^3 prior to shut off by supervising personnel)
- Larger volume (up to 192 m^3) loss of MGO from a ruptured fuel storage tank, resulting from vessel collision or grounding

As detailed in the Oil Pollution Emergency Plan (OPEP) for the survey, taking into account the nature and scale of the activity and the potential spill risks involved, response arrangements comprise components of the vessel Shipboard Oil Pollution Emergency Plan (SOPEP) that manage the environmental impacts of a spill, supported as required by applicable established, statutory Oil Spill Contingency Plans (OSCPs). Implementation of response strategies outlined within the statutory OSCPs remains with the relevant AMSA and state Combat Agencies. Table 7-1 outlines the sensitive receptors potentially impacted by the worst credible spill, where they are found in relation to the survey area and the distance from the closest possible spill source and a summary of the potential impacts resulting from contact with Marine Gas Oil (MGO). Table 7-1 also outlines response strategies that may be employed by the relevant Control Agency in state waters, which may reduce potential impacts to that receptor.

Scientific monitoring could be improved by gathering baseline data at locations within the predicted spill trajectory area. Given the largely unpredictable trajectory and behaviour of hydrocarbon spills and multiple locations at which a spill could occur throughout the area, pre-spill baseline surveys at predicted sites may not cover affected areas and therefore may not be useful during impact assessment. It is seen as more feasible and cost effective to undertake scientific monitoring post-spill with knowledge of the actual trajectory taken by the spill, thus allowing targeted surveys to be undertaken.

Drills of the OPEP, including the vessel SOPEP, will be conducted to assess the effectiveness of the arrangements, taking into account the nature and scale of the risk of a hydrocarbon spill.

The OPEP will be tested on the following occasions:

- Prior to each phase of the survey commencing
- No later than 12 months since the last test. Should this test fall within a time period where no acquisition is underway (and therefore no vessel on which to test the OPEP is available), a desk-based test of the OPEP (including testing of the communications sequence and roles and responsibilities) will be conducted. At a minimum of three monthly intervals throughout the survey
- Following any significant amendment of the arrangements

Table 7-1: Receptors potentially impacted by a MGO spill occurring within the survey area and oil spill response strategies potentially employed

Receptor	Proximity to potential spill source	Oil spill response strategies potentially employed by Control Agency
Water quality	Overlap	None. Since MGO tends not to become entrained in water, impacts to water quality are restricted to the upper limits close to the surface slick. A reduction in water quality may have impacts on biota and ranging from mortality to sub lethal damages. Oxygen concentrations in water have been noted to decrease as a result of increased bacterial respiration.
Cetaceans	Overlap	Oiled wildlife response
Pinnipeds	Overlap	Oiled wildlife response and protection and deflection from known haul-out locations
Marine reptiles	Overlap	Oiled wildlife response
Birds	Overlap	Oiled wildlife response
Fish (including sharks)	Overlap	None
Marine Invertebrates	Overlap	None
Plankton	Overlap	None
Sandy beaches	Overlap	Shoreline clean-up and protection and deflection
Intertidal and shallow reefs	Overlap	Shoreline clean-up and protection and deflection
Exposed rocky shoreline	Overlap	Protection and deflection
Submerged rocky/hard coral reefs	Overlap	None
Wetlands	Overlap	Shoreline clean-up and protection and deflection
Macroalgae (incl. seagrass and kelp)	Overlap	Protection and deflection
Mangroves	Overlap	Shoreline clean-up and protection and deflection

8 STAKEHOLDER CONSULTATION

The survey consultation process involves four key steps:

- Step 1: initial consultation, identification and first contact with stakeholder
- Step 2: integration of feedback into EP and survey plans
- Step 3: ongoing consultation and notifications for survey commencement and survey changes
- Step 4: ongoing consultation and notification for other phases should the survey have to be completed in more than one phase (preferential to complete the survey in just one phase)

In July 2014 stakeholders were issued with the initial stakeholder consultation letter providing details of the activity, including timings and planned location. Notification letters on was issued on the 15th November 2014 and 1st January 2015 to provide update in survey timings and the intended sail lines. Table 8-1 lists all stakeholders that were contacted in the preparatory consultation.

ION offered the opportunity for face to face meetings with stakeholders. In October 2014, a number of meetings were held across South Australia and Victoria to better understand stakeholder concerns. Each piece of feedback from stakeholders was reviewed in detail, practicability assessed and the merits evaluated and taken into consideration in the preparation of the approved EP. Table 8-2 summarises stakeholder's responses and actions ION will take to address these responses.

No other responses at the time of preparing this EP summary to this consultation have been received, and no other issues or concerns regarding the proposed activities have been raised by any other stakeholders contacted during the preparatory consultation. Therefore, in the context of the nature and scale of the proposed activity, the environmental sensitivities and values of the survey area, and the outcomes of the risk assessment conducted in the accepted EP, ION is satisfied that further attempts to contact unresponsive stakeholders would not alter significantly the manner in which the activity is to be conducted.

Further notifications from ongoing consultation are not expected to raise any new or additional concerns as these are considered to have been raised in the initial consultation stage (Step 1).

In the event that the survey is not completed in the first phase, at least 3 months prior to each subsequent phase a consultation letter will be issued to stakeholders outlining the proposed activity (location, timing, duration, parameters) and details of the ongoing consultation methods and feedback from stakeholders will be assessed and evaluated. This will also include a review of the stakeholder consultation database to identify any new or additional stakeholders not previously included, and update of any contact details where appropriate.

ION will continue to engage with relevant stakeholders, including the fishing industry, during the preparation and execution of the survey. Any comments received following the acceptance of the EP will be assessed and where necessary further discussions with the stakeholder will occur. This process will provide transparent engagement with stakeholders and ensure that impacts and risks to stakeholders are continually reduced to ALARP.

Should any comments or feedback be raised by stakeholders prior to or during the survey that were not previously identified in the preparation of the EP, the impacts and risks will be assessed and if a significant new or increased impact or risk be identified, the EP will be resubmitted to NOPSEMA under Regulation 17. If the feedback results in a change in operations, but is not considered to result in significant new or increase impact or risk, a Management of Change will be undertaken.

This ensures that any impacts of the survey on stakeholder's activities or interests are continually reduced to ALARP, in line with the EMS. This process is outlined in Figure 8-1 below.

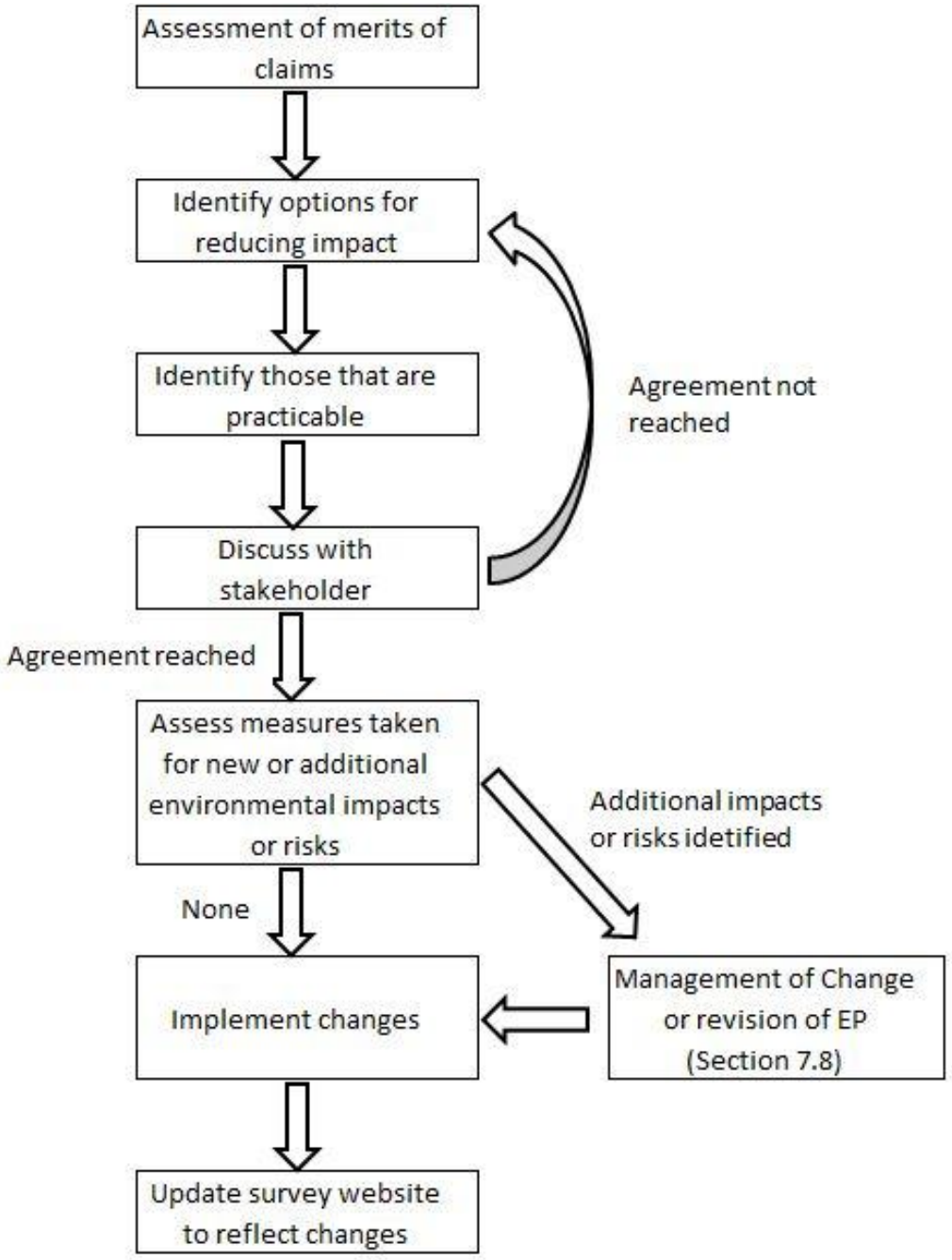

Figure 8-1: Process for assessing and evaluating ongoing stakeholder feedback for the duration of the survey preparation and acquisition

Table 8-1: List of stakeholder contacted in the preparatory consultation (Step 1)

Fisheries	Government	NGO/Research	Oil and Gas	Other	Shipping
NATIONAL					
Australian Fisheries Management Association	Australian Government Department of Agriculture, Fisheries and Forestry (DAFF)	Australian Marine Conservation Society	Australian Marine Safety Authority		
AUSTRALIAN FISHING ENTERPRISES PTY. LTD.	Australian Government Department of Agriculture, Fisheries and Forestry (DAFF)	Commonwealth Scientific and Industrial Research Organisation	Shipping Australia		
Australian Government Fisheries Management Authority (AFMA)	Australian Government Department of Resources, Energy and Tourism	Defence Science and Technology Organisation			
Australian Seafood Industry Council	Australian Marine Safety Authority	International Fund for Animal Welfare			
Commonwealth Fisheries Association	Department of Defence - Air Command HQ	International Fund for Animal Welfare			
National Seafood Industry Alliance	Department of Defence - Australia Hydrographic Office	Blue Whale Study Inc.			
Bass Strait Central Zone Scallop Fishery	Department of Defence - Directorate of Property Acquisition, Mining and Native Title Infrastructure Division				
Bass Strait Central Zone Scallop Fishery	National Native Tribunal				
Small Pelagic Fishery	Geoscience Australia				
Southern and Eastern Scalefish and Shark Fishery	Department of Environment (DoE)				
Commonwealth Trawl and Scalefish Hook Sectors					
Great Australian Bight Trawl Sector					
Shark Gillnet and Shark Hook Sectors					
Southern Squid Jig Fishery					
Eastern Tuna and Billfish Fishery					
Skipjack Tuna Fisheries					
Southern Bluefin Tuna Fishery and associated aquaculture					
Western Tuna and Billfish Fishery					
Southern Rock Lobster Limited					
South East Trawl Fishing Industry Association (SETFIA)					
SOUTH AUSTRALIA					
Australian Southern Bluefin Tuna Aquaculture Industry Association	City of Port Lincoln	Conservation Council of SA	Bight Petroleum Pty Ltd	Port Lincoln Aboriginal Community Council	Boating Industry Association of SA
DI FISHING EDEN PTY LIMITED	District Council of Ceduna	Flinders University Cetacean Ecology, Behaviour and Evolution Lab (CEBEL)	Chevron Australia New Ventures Pty Ltd	Tourism SA	Flinders Ports Pty Ltd
EMILY KRSTINA (AUSTRALIA) PTY. LTD.	District Council of Lower Eyre Peninsula	The Wilderness Society (SA) Inc.		Yalata Aboriginal Community, Ceduna	Ports SA
Great Australian Bight Fishing Industry Association	Federal Member for Grey				
Marine Fishers Association of SA	Federal Member for Mayor				
MARKANE SEAFOODS PTY LTD	SA Department of Environment Water and Natural Resources				
PIRSA Fisheries	SA Department of Environment Water and Natural Resources				
RAPTIS FISHING LICENCES PTY LTD	SA Department of Manufacturing, Innovation, Trade, Resources and Energy (DMITRE) - Petroleum				
RecFish SA	Department for Planning, Transport and Infrastructure (DPTI)				
SA Aquaculture Council Inc.	SA Government - Department of the Premier and Cabinet				
SA Rock Lobster Advisory Council Inc.	SA Minister for Agriculture Fisheries and Forest				
Lakes and Coorong Fishery	SA Minister for Mineral Resources and Energy				
Blue Crab Fishery	SA Minister for Regional Development				

Fisheries	Government	NGO/Research	Oil and Gas	Other	Shipping
SA Sardine Industry Association	SA Minister for Sustainability, Environment and Conservation				
Abalone Fishery	SA Research and Development Institute				
Charter Boat Fishery	SA Chamber of Mines and Energy				
Marine Scalefish Fishery	SA Recreational Fishing Advisory Council				
Miscellaneous Fishery	South East Trawl Fishing Industry Association				
Prawn Fisheries: Gulf St Vincent, Spencer Gulf and West Coast	State Member for Finniss				
Spencer Gulf and West Coast Prawn Fishermen's Association	State Member for Flinders				
Rock Lobster Fishery	State Member for Goyder				
Sardine Fishery	Kangaroo Island Council				
TONY'S TUNA INTERNATIONAL PTY LTD	Regional Development Australia, Whyalla and Eyre Peninsula (RDA WEP)				
Tuna Boat Operators Association SA					
TUNA FARMERS PTY LTD					
VALENTE HOLDINGS PTY LTD					
Wildcatch Fisheries SA					
SA Rock Lobster Advisory Council					
Southern Zone Abalone Management Inc.					
Central Zone Abalone Fishery					
Abalone Industry Association of SA Inc.					
South Australian Northern Rock Lobster Fishermen's Association					
TASMANIA					
TAS Seafood Industry Council (TSIC)	Department of Primary Industries, Parks, Water and Environment	3D Oil T49P Pty. Ltd.	Tourism TAS		
Sustainable Shark Fishing Inc.	Department of Primary Industries, Parks, Water and Environment (DPIPWE) - Water and Marine Resource Division				
Abalone Fishery	Department of Primary Industries, Parks, Water and Environment (DPIPWE) - Water and Marine Resource Division				
The TAS Abalone Council (TAC)	DPIPWE - Environment Protection Authority TAS				
Commercial Dive Fishery	Parks and Wildlife TAS				
Giant Crab Fishery	DPIPWE - Environment Protection Agency Division				
Rock Lobster Fishery	DPIPWE - Heritage TAS				
Commercial Scalefish Fishery	Department of Infrastructure, Energy and Resources				
Scallop Fishery (Scallop Fishermen's Association of Tasmania)	Circular Head Council				
Shellfish fishery	King Island Council				
Seaweed fishery	West Coast Council				
TARFish	Huon Valley Council				
	Watatah-Wynyard Council				
	Burnie Council				
	Central Coast Council				
	Devenport Council				
	Latrobe Council				
	West Tamar Council				
	George Town Council				
	Dorset Council				
	Flinders Council				
	TAS Minister for Energy and Resources				
	TAS Minister for Environment, Parks and Heritage				

Fisheries	Government	NGO/Research	Oil and Gas	Other	Shipping
	Minister for Energy and the Minister for Environment				
	Minister for Resources				
	Marine and Safety TAS				
VICTORIA					
Scallop Fisherman's Association Inc.	Department of State Development, Business and Innovation	Cape Energy (VIC) Pty Ltd	Tourism VIC		
Seafood Industry VIC	Department of Environment and Primary Industry	Esso Australia Resources Pty Ltd			
Lakes Entrance Fishermen's Co-operative Society Ltd (LEFCOL)	Parks VIC	Basin Oil Pty Ltd			
Southern Shark Industry Alliance Inc.	Department of Transport, Planning and Local Infrastructure	BHP Billiton Petroleum (VIC) Pty Ltd			
Abalone Fishery	Glenelg Shire Council	Origin Energy Resources Ltd			
Giant Crab Fishery	Moyne Shire Council	Santos Limited			
Rock Lobster Fishery	Warrnambool City Council	Roc Oil (Vic) Pty Ltd/ Cooper Energy			
Scallop Fishery	Corangamite Shire Council	Nexus Energy VICP54 Pty Ltd			
Snapper Fishery	Colac Otway Shire Council	Carnarvon Hibiscus Pty Ltd			
Black Bream Fishery	Surf Coast Shire Council	Bass Strait Oil Company Ltd			
King George Whiting Fishery	Borough of Queenscliffe	Seaquest Petroleum Pty Ltd			
Sea Urchin Fishery	Mornington Peninsula Shire Council	Trident Energy Limited			
Eel Fishery	Bass Coast Shire Council	WHL Energy Limited			
Abalone Aquaculture	South Gippsland Shire Council				
VRFish	Wellington Shire Council				
	East Gippsland Shire Council				
	VIC Minister for Energy and Resource				
	VIC Minister for Environment and Climate Change				
	Department of State Development, Business and Innovation				
	CarbonNet				

Table 8-2: Stakeholder submissions and outcomes

Note that stakeholders who responded with no issues or objections, or did not provide a response are not included in this summary table.

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
Fisheries					
Australian Fisheries Management Association (AFMA)	National	18/07/2014 – email	Advises of fisheries that are active within the area which require consultation: • Commonwealth Trawl Sector • Gillnet Hook and Trap Sector • Great Australian Bight Fishery • Squid Jig Fishery • Bass Strait Central Zone Scallop • Small Pelagic Fishery • Eastern Tuna and Billfish Fishery • Southern Blue Fish Tuna Fishery • AFMA would also appreciate being informed of 'any changes'.	Fisheries noted and described in EP AFMA have been notified of survey timeframe changes, and will continue to be notified of any further changes.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Southern Squid Jig Fishery (SSJF)	National	21/07/2014 – email	Main points of concern include: • Survey occurs during squid season: January to June each year • Anecdotal evidence suggests that seismic testing frightens squid from an area, or possibly kills squid • Effect on squid eggs and juveniles from seismic activity is unknown • Anecdotal evidence suggests that squid catches fall alarmingly when seismic testing is carried out in the areas where boats are fishing, and that area becomes less productive for some seasons after • SSJF believe that concerns relating to 'lack of science' around seismic activity and impacts to squid means that there should be moratorium on seismic activity in known areas of commercial catches during the squid season. Ask that seismic surveys are not carried out in the areas of known squid catches between January and June each year • State there is little if any recorded information on the immediate effect of seismic surveys on fishing activities • State that Squid fishing is carried out in waters between 25 metres and 120 metres in depth, which covers most waters adjacent to the Victorian coast as well as most of Bass Strait and includes areas along the east coast of Tasmania.	Advises that there can be a face to face meeting prior to survey to advise party of step by step process and more detail information of proposed activity Concerns noted, request sent for anecdotal evidence, SSJF advises this evidence is requested from fishermen. The request that seismic surveys are not carried out in the areas of known squid catches between January and June each year cannot be met by ION due to weather windows and increasing H&S risk. Concerns of seismic impacts to squid (adult and larval/egg stages) have been considered and assessed. ION letter sent to stakeholder on 26/09/2014 addressing concerns: • Presented literature review and subsequent discussion of limited potential disturbance to Cephalopods in response to anecdotal evidence. o Literature suggests that marine invertebrates, which typically do not contain gas spaces, appear to be remarkably resilient to seismic sound (Keevin and Hempen, 1997). The limited acoustic sensitivity of squid is related to their lack of any substantial gas-filled spaces (i.e. swim bladders) such as those associated with pressure detection in fishes o La Bella et al. (1996; as cited in Moriyasu et al., 2004) reported that no apparent changes in trawl catches were found in short-finned squid (Illex coindetti) in the area prospected one day before at sound source levels of 210 dB re 1 µPa2.s at 1 m	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				o Except for squid eggs and larvae in the direct vicinity of a seismic source, planktonic and adult organisms are unlikely to be affected significantly by seismic source discharges as a result of noise decay (McCauley, 1994) o physiological affects to adults are not expected, even at close proximity, furthermore adults are unlikely to be exposed as a result of soft start procedures inducing a behavioural response (within 10 – 12 km). o physiological impacts to cephalopods larvae/eggs may occur within ~10 km of the source, although evidence shows that prolonged exposure is required (e.g. days), which given the transient nature of the vessel and that any given area will only be exposed to one sail line (due to sail line spacing) exposure is unlikely to exceed that required to lead to detrimental effects • Provided justification for survey operations during the squid fishing season - given the lack evidence to suggest a link between seismic operations and adverse impacts on squid physiology, behaviour and catch rates described in the literature, the transient nature of the survey vessel and widely spaced sail lines reducing the amount of time the survey vessel operates in a given area. • Described relevant mitigation measures to be included in the EP o Soft starts and low vessel speeds o Face to face meetings prior to survey commencement o Website to communicate vessel location, planned movements, equipment, vessel specifications and maps. o Support Vessel to manage interactions with other marine users ION sent email on 20/11/2014 providing update on survey timing, start date, proposed acquisition – no further response received from stakeholder	
Southern Rock Lobster Limited (SRL)	SA	4/08/2014 – letter sent via email	Main points of concern include: • The proposed survey covers most of the fishing area over which the southern rock lobster fishery operates, and also is scheduled to be undertaken at a time (November to April) that is the peak fishing season in most areas • Concerns of impacts from seismic noise to adult, and in particular, larval rock lobsters • Seismic activity may also interfere with actual fishing operations • Opposes survey in current form	Face to face meeting (with SARLAC and SRL) held 8/10/2014 from which ION developed the following management controls: 1. Compensation policy to be agreed with industry and implemented 2. Support vessel will scout ahead of survey vessel removing and replacing pots if necessary 3. Website providing details of survey vessel location and plans 4. Offer option for text messaging to provide daily update of co-ordinates of survey vessel 5. FLO appointed during activity	Provide updated consultation on controls 1-5 Provide compensation policy for review once finalised Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			Requested following further detail: • What are the processes / protocols in place to notify fishers / industry when and where there will be, and where there has been, interferences with commercial fishing gear? • What provisions will be put in place to compensate commercial fishers in the instance of having fishing gear is interfered with including lost and damaged and for the subsequent impact on catches? • What sureties if any can be given to our industry that this proposed seismic survey would not have any impacts on the recruitment of juvenile Rock Lobsters into the fishery? • A face to face meeting requested to understand other steps in the process.	(These will be fully developed/contracted by ION when the survey vessel agreement is established) Concerns for inference with fishing operations will be addressed through regular updates via notice to mariners. Concerns relating to seismic impacts on rock lobsters (adult and larval stages) have been considered and assessed in the impacts description of the EP (Section 4.3). ION letter sent to stakeholder addressing concerns: • Provided rationale behind survey timing • Provided a summary of available literature relating to the effects of seismic activity on crustacea physiology, behaviour and catch rates (Section 4.3). • Provided evidence for no significant impact to the recruitment of juvenile rock lobster • Proposed mitigation measures relating to Southern rock lobster and fishing operations o Face to face meetings with key representatives of southern rock lobster industry o Website to communicate vessel location, planned movements, equipment, vessel specifications and maps. o Engagement of Fisheries Liaison Officer with industry experience to act as communication focal point o Support Vessel to manage interactions with other marine users o Informed that in the event that any gear is interfered with, damaged or lost as a direct result of survey activities, fishers can contact the Fisheries Liaison Officer directly who can assess and process the claim in relation to the compensation policy.	commencement, and each phase)
SA Rock Lobster Advisory Council (SARLAC)	SA	16/07/2014 – email	Reply received with regards to Rock Lobster questions and request for different coordinates Main points of concern include: • Possible impacts on early lifecycle stages of the Southern Rock Lobster and recruitment of juvenile Rock Lobsters from seismic activity • Interference with actual fishing activity • Season runs from October to May each year which overlaps with the timing of the proposed survey work Requests for further information include: • What is the process / protocol you have in place to notify fishers / industry where there have been interferences with commercial fishing gear?	Coordinates in different format will be provided on the website Face to face meeting prior to survey held (see below) Concerns for inference with fishing operations will be addressed through regular updates including notice to mariners, the website and text messaging service Concerns of seismic impacts to rock lobsters (adult and larval stages) have been considered and assessed in the impacts description of the EP. ION letter sent to stakeholder addressing concerns: • Outlined stakeholder engagement strategy	See below

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			• What provisions have you made to compensate commercial fishers in the instance fishing gear is interfered with and catches are impacted on?	o Website to provide daily location updates o Engagement of FLO o Use of support vessels to act as scouts to manage potential interactions with other marine users o Compensation policy will be in place (to be finalised) • Provided rationale behind survey season • Provided rationale for overlap of survey with fishing areas • Provided summary literature review of effects of seismic activity on crustaceans (sections 4.2, 4.3) • Provided mitigation measures o Stakeholder engagement strategy o Fisheries liason officer to act as focul point and process claims for damage or disruption • Offered presence at face to face meeting (see below)	
		8/10/2014 – joint meeting held between SARLAC and SRL	Primary concerns of the fishery regarding seismic activity include short and long term impacts: • Short term impacts on the fishery operation may include the survey potential excluding fishermen from certain areas with negative effects on both the season's catch and also, given the basis of quotas, the future quotas set. There is also potential for equipment to be damaged, further reducing catch rates • Long term impacts on the fishery include the impacts of seismic activity on all life stages of the rock lobster including adults, larvae and eggs Potential mitigation measures were also discussed, in which subsequent actions were formed	• ION to provide summary of meeting • Justin Phillips (JP; on behalf of SARLAC and SRL) to provide names of potential Fishery Liaison Officers • JP to provide any anecdotal evidence of impacts of seismic on rock lobster eggs, larvae or adults • JP to provide information on specific areas of high important to the rock lobster industry • Engagement to continue; ION to inform SARLAC/SRL of survey start dates, final survey area, website details, Fisheries Liaison Officer details once confirmed ION to finalise and confirm the compensation policy and broad communication procedure (in the event of a claim) and provide to JP ION to develop following mitigation measures: 1. Compensation policy to be agreed with industry and implemented 2. Support vessel will scout ahead of survey vessel removing and replacing pots if necessary 3. Website providing details of survey vessel location and plans 4. Offer option for text messaging 5. FLO appointed during activity (These will be fully developed/contracted by ION when the survey vessel agreement is established)	Provide updated consultation on controls 1-5 Provide compensation policy for review once finalised Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		15/10/2014 – email	• Actions from meeting summarised and agreed	• JP provided a fishery liaison officer	The remaining actions (compensation policy,

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			• Advised with regards to the survey and EP preparation, the sail lines are undergoing a review and an acquisition plan is under development. ION will forward details along with an update regarding commencement date as soon as possible. • ION has requested feedback from JP on the compensation policy once drafted, to ensure it is fit for purpose from a fishing industry point of view A second update regarding research into the impacts of seismic, the IAGC (International Association of Geophysical Contractors) (of which ION is a member) and OGP (International Association of Oil and Gas Producers) have recently released an RFP for fish behavioural studies in response to seismic survey activities. While ION does not intend to carry out independent research, these representative bodies are undertaking this work for the benefit of all members.	• ION provided JP with IAGC Request for Proposal	communication strategy, Fishery Liaison Officers and website) are under development and ION will also provide an update following confirmation of the survey lines and acquisition plan.
		21/12/2014 - email, 5/05/2015 - email	SARLAC informed of survey updates and respond with query regarding use of support vessel, start date, compensation policies, communication protocols and industry liaison personnel.	Updated from ION to JP: The compensation policy is currently being reviewed by ION, it will be sent to JP and be in place prior to survey commencement. In regards to other aspects of the survey, such as scout vessel and FLO selection, ION will get in contact closer to the time when details of the survey have been confirmed thus allowing more effective and informed decisions.	
Abalone Industry Association of South Australia (AIASA)	SA	21/10/14 - Joint meeting with ASBTIA, SA Oyster industry, SA Abalone industry and SA Sardine industry, SA Rock Lobster industry	• Summary of concerns raised in meeting: • Concerned over impacts of seismic activity on eggs/larvae and delayed impacts to abalone stocks • Until impacts to eggs/larvae are known, will oppose any seismic activity within 100 km of abalone spawning areas • No specific abalone spawning areas have been identified, can occur all along the south coast of Australia • Will provide written response	Awaiting written response (see below)	Respond to formal requests on receipt of better resolution map. Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		5/11/2014 - letter	Current position: • Opposed to all seismic surveys within 200 km of harvest grounds – marked up map provided • Support views of sardine and tuna industry that post April, prior to December is the only time seismic activity can be contemplated. Green-lip spawning is in October, so this does not suit. Consequently distances are critical.	• ION has requested the map via phone call (on the 14/11/2014) as it was not attached in the letter – Michael confirmed he is still waiting for it from SARDI and will send on. Michael also advised only a few lines will be affected • Map received 21/11/2014 embedded in email, requested pdf or jpeg since resolution is too poor to read legend • Map received in jpeg format. ION requested clarification that the 'Mapcode blocks' in the map are equivalent to the SAUs referred to in the email, and that these represent the harvest grounds outlined in your letter • ION to review request once location of harvest grounds are better understood ION awaiting response (consultation continued through ACA below)	
			See correspondence with Abalone Council of Australia (ACA) below for further consultation	ION sent letter to stakeholder addressing concerns as part of further consultation with ACA (see below)	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
Abalone Council of Australia (ACA)	National	26/11/2014 - email	ACA noted the following: • The *Proposed Survey Location Map* details the seismic "sail lines" - these lines appear to come very close to inshore reefs inhabited by abalone in SA, Vic and Tas. Notwithstanding that you have provided coordinates, can you provide further detail about the proximity of the sail lines to the coast itself - the scale of the map that you have provided makes it difficult to determine precisely how close the sail lines will be to the coastline in each state. • The attached reports identify risks to marine life from seismic pulses and in particular identify deformation of scallop larvae resulting from sustained exposure to seismic pulses. Indeed, the de Soto study showed significant developmental delays and body abnormalities in scallop larvae post exposure to seismic pulses. What is your response to these findings? Given the outcomes and conclusions of the de Soto report, clearly there may be potential risks to larvae from other marine species such as abalone and rock lobster. Can you please identify any additional scientific reports that deal with the effect of seismic pulses on marine life. • Commercial abalone fisheries in South Australia, Victoria and Tasmania supply 3500 tonne of product annually with abalone exports in all forms valued in 2012/2013 at approximately $163 million (FOB) - most of which is exported to China, Hong Kong and Singapore. These valuable fisheries support harvesting and processing operations in small communities along the coastlines of SA, Victoria and Tasmania. Any loss of fishery productivity from seismic operations could have a significant detrimental effect on these communities and as such it is necessary and appropriate for companies such as ION Geophysical to adopt a precautionary approach in its commercial activities. • What guarantees can you provide that the proposed seismic survey will not have any measurable (detrimental) effect on any stage of the life cycle of abalone that inhabit inshore reefs along the coastline of South Australia, Tasmania and Victoria. Can you support any guarantee with relevant, recent and robust scientific reports? If so can you identify these reports? • Future Evidence/Proof of loss of abalone fishery productivity caused by seismic operations conducted by ION Geophysical may result in a class action against your client (ION) for compensation/damages relevant to any losses incurred by Australian abalone fishing/processing companies.	ION sent letter to stakeholder addressing concerns via email to all stakeholders in ACA email list on 22/01/2015 • Provided higher resolution maps of sail lines • Provided description of location of sail lines • Advised that the survey vessel would not operate in state waters or water depths <30 m • Offered to provide sail lines in GIS format • Provided analysis and discussion of both literature provided and literature reviewed in EP (section 4.2) in relation to proposed survey. o Concluded that potential detrimental effects of the discharge of the seismic source on planktonic organisms are only expected within metres of the source. At this localised scale, and considering the high natural mortality rates of larvae, the proportion of the planktonic population potentially impacted is considered negligible at the population level. • Informed that EP would be developed to meet regulations and that no seismic acquisition will be carried out until the EP, including the risk assessment, has been accepted. • ION informed that it does not consider it likely that the proposed survey would have a significant impact on the abalone populations such that the abalone fishing industry would experience significant losses. Furthermore, due to the stochastic nature of the marine environment, and the multiple variables that may influence abalone demography and population dynamics, quantifying any impact of seismic alone is fraught with difficulties. As such, ION's current policy is not to compensate for any perceived loss of catch due to the presence of the survey vessel or the discharge of seismic emissions. Currently no further response from stakeholder.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Abalone Industry Committee	VIC	13/04/2015 email	Email request for reference locations	Reference locations sent	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Southern Zone Abalone Fishers Association	SA	28/11/2014	Enquiry about planned activities in the Southern part of South Australia. Pointed out they fish in 13 spatial units close to shore and are aware that activities at some distance can greatly impact on spawning	ION sent letter to stakeholder addressing concerns as per further consultation with ACA (see above).	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
					logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Primary Industries and Regions SA (PIRSA)	SA	4/08/2014 – letter received by email	PIRSA advises that the proposed area overlaps with: the Southern Australian Marine Scalefish, Giant Crab, Southern and Northern Zone Rock Lobster, Abalone and Sardine Fisheries. Concerns that impacts to larval/juvenile stages of these species with the proposed activity are not known. Advise to consult directly: • South Australian Rock Lobster Advisory Council Inc. • South Australian Sardine Industry Association • Marine Fishers Association of South Australia • Southern Zone Abalone Management Inc. • Central Zone Abalone Fishery • Abalone Industry Association of SA Inc. • Charter Boast Fishery • RecFishSA • South Australian Northern Rock Lobster Fishermen's Association • South East Professional Fishermen's Association • Australian Southern Bluefin Tuna Industry Association • Australian Fisheries Management Authority	Consultees noted, and status of consultation: • South Australian Rock Lobster Advisory Council Inc.: 15/07/2014 – consultation letter sent via email • South Australian Sardine Industry Association: 15/07/2014 – consultation letter sent via email • Marine Fishers Association of South Australia: 15/07/2014 – consultation letter sent via email • Southern Zone Abalone Management Inc. – 5/08/2014 – consultation letter posted (note: SA Abalone Fishery 15/07/2014 – consultation letter sent via email) • Central Zone Abalone Fishery: 5/08/2014 – consultation letter posted (note: SA Abalone Fishery 15/07/2014 – consultation letter sent via email) • Abalone Industry Association of SA Inc.: 5/08/2014 – consultation letter posted (note: SA Abalone Fishery 15/07/2014 – consultation letter sent via email) • Charter Boast Fishery: 15/07/2014 – consultation letter sent via email • RecFishSA: 16/07/2014 – consultation letter sent via email • South Australian Northern Rock Lobster Fishermen's Association: 5/08/2014 – consultation letter posted (note: Rock Lobster Fishery 15/07/2014 – consultation letter sent via email) • South East Professional Fishermen's Association: 15/07/2014 – consultation letter sent via email to provided contact • Australian Southern Bluefin Tuna Industry Association: 15/07/2014 – consultation letter sent via email to provided contact • Australian Fisheries Management Authority: 15/07/2014 – consultation letter sent via email to provided contact Concerns regarding seismic impacts to commercial fish/invertebrates (adult and larval stages), and highlighted fisheries (including CSIRO survey) have been considered and assessed and detailed in the impacts and environment description of this EP. Comments regarding the migratory pathway for SBT overlapping the survey area have been found not applicable as the species were found through tracking and tagging to migrate south-west into the GAB from WA, where the majority of the species follow the same migratory route back	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				(Basson et al., 2012)	
		4/12/2014 Letter by Email	Response to notification of survey updates informs changes to not alter original response.	None required	
		11/12/2014	PIRSA enquire about survey start date and location	ION advise of possible mid-february 2015 start date	
Australian Southern Bluefin Tuna Industry Association (ASBTIA)	SA	1/09/2014 – email	ASBTIA has substantial concerns with the potential timing of operations through the western section of the proposed area; specifically west of longitude 140°E. ASBTIA request that they are included in further consultation regarding this proposal.	Face to face meeting prior to survey held (see below)	ION will review any additional feedback received Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		21/10/14 –Joint meeting with ASBTIA, SA Oyster industry, SA Abalone industry and SA Sardine industry, SA Rock Lobster industry	Key areas of concern: • Impacts to tuna migration into the GAB (from east and west) • Impacts to CSIRO survey • Interaction with fishing operations • Cumulative effects of multiple surveys occurring simultaneously • Delayed effects of impacts to larvae on adult population • Noise modelling and incorporation of concerns into EP ASBTIA to respond formally to ION	• ION to: • Provide details of noise modelling conducted for BightSPAN • Provide details relating to the noise modelling used in the impact assessment for OtwaySPAN • Enquire internally as to whether any case studies regarding ION's operations with pelagic fisheries elsewhere globally, provide details if case studies are known • The latest map of the OtwaySPAN survey lines. • Provide feedback to formal responses • Consider implications of not operating within the region between October and March. • Better understand weather issues in the GAB; can the acquisition season be extended into June/July?	
		23/10/14 – email	Information requests: • The sound modelling done for the BightSPAN survey undertaken April to July 2009 in western GAB area • Anticipated sound distribution for the proposed OtwaySPAN survey (2015 – 2017) • Latest OtwaySPAN proposal (i.e. v6 or v7) map • Any information ION has on potential seismic impacts on pelagic fish • Case studies of ION's global experience with pelagic fisheries • A summary report about the meeting	ION provided information requested in addition to the shapefile of the revised sail line locations on the 7th and 18th November via email. Also provided following updates on the activity: • Following advice from fishermen during the meeting in Port Lincoln, ION has extended the acquisition season to June 30 to allow acquisition in what was previously considered a poor weather window. • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within the time frame available. • Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west. An ALARP assessment was conducted and it was considered practicable to undertake acquisition in this manner.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				• Due to the longer acquisition season and practicable acquisition plan, ION can commit to staying out of waters west of Kangaroo Island after March 20th, and can commit to acquiring the sail line that crosses the Spencer Gulf (AU3-0950 in the attached figure) after March 31st. While ION understands that ASBTIA has previously requested to other operators that activities in the eastern GAB/KI only occur after March 31st, ION believes that March 20th is a suitable compromise for the following reasons: o The cancellation of the CSIRO survey in 2015 removes any potential impact of OtwaySPAN on the aerial survey and the SBT quotas o Migration of SBT into GAB is largely complete by February (ASBTIA pers comm) o Following previous year's activities, fishing operations could be expected to be tailoring off, if not complete, by mid-March. Those present at the meeting in Port Lincoln also expressed that impacts to fishing operations are of lesser/no concern; the issues regard migration of SBT into the GAB. o Sail line AU3-0950 will not be acquired before March 31st • ION will stand down and move away from towing fishing vessels, maintaining at least 10 km separation distance to avoid any impact to fishing vessels still operating after March 20	
		12/12/2014	Following survey update notification from ION, ASBTIA requested updated map of proposed sail lines and further details on mitigation measures	Ion provided updated map of sail lines and further mitigation measures via email on 16/12/2014.	
		3/2/2015	ASBTIA enquired about proposal	ION informed proposal is still going through the approvals process	
		01/05/2015	ASBTIA "note the possible start date of the survey is now considerably earlier than advised previously (i.e. later than 20th December 2014, then after Mid February 2015). An earlier overall start date is likely to have implications for the SBT industry, please keep us informed through the planning process."	ION advised ASBTIA: Please find the consultation letters as sent previously attached. It was advised in the previous consultation notification update: "As mentioned in the previous letter, acquisition may occur over a three year time period, however is not intended to occur over the entire acquisition season (November – June) across all three years, with the total duration still expected to be 110 days." This advice still currently stands, however the time period in which the survey may occur has been shortened from June to May in order to avoid peak southern right whale migrations. Please also be advised that the commitments below will still be adhered to as previously consulted with ASBTIA, and will be included within the EP to NOPSEMA: • Sail line AU3-0950 will not be acquired between Oct 1 and March 31	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				• Acquisition will not occur west of Kangaroo Island between Oct 1 and March 20 ASBTIA (and all stakeholders) will be kept informed throughout the survey planning, and will also be sent a notification 3 months prior to survey commencement with further details, such as survey website. • Development of the following control measures: o Acquisition will not occur west of Kangaroo Island between Oct 1 and March 20 in any season o Sail line AU3-0950 will not be acquired between Oct 1 and March 31 o Website to be developed providing details of survey vessel location and plans o Provide option for text messaging o FLO appointed during activity	
South Australia Sardine Industry Association (SASIA)	SA	21/10/14 -Joint meeting with ASBTIA, SA Oyster industry, SA Abalone industry and SA Sardine industry, SA Rock Lobster industry	• Co-dependent on the success of the SBT industry and therefore supports the view taken by SBT industry • Upwelling in the KI region is highly productive resulting in spawning in this region • Given location of survey fishery has own concerns independent of SBT • Catch rates versus survey results indicate migration of sardines into Spencer Gulf where most catch is taken • The seismic survey line traversing the entrance to Spencer Gulf may impede sardine migration into these areas and may also effect stock assessments. • Request that the area is avoided between Jan and March. SASIA to formally respond	ION provided following updates on the activity: • Following advice from fishermen during the meeting in Port Lincoln, ION has extended the acquisition season to June 30 to allow acquisition in what was previously considered a poor weather window. • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within the time frame available. • Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west. An ALARP assessment was conducted and it was considered practicable to undertake acquisition in this manner. • Due to the longer acquisition season and practicable acquisition plan, ION can commit to staying out of waters west of Kangaroo Island after March 20th, and can commit to acquiring the sail line that crosses the Spencer Gulf (AU3-0950 in the attached figure) after March 31st. While ION understands that ASBTIA has previously requested to other operators that activities in the eastern GAB/KI only occur after March 31st, ION believes that March 20th is a suitable compromise for the	Await formal response, ION will review any additional feedback received, if any. Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				following reasons: o The cancellation of the CSIRO survey in 2015 removes any potential impact of OtwaySPAN on the aerial survey and the SBT quotas o Migration of SBT into GAB is largely complete by February (ASBTIA pers comm) o Following previous year's activities, fishing operations could be expected to be tailoring off, if not complete, by mid-March. Those present at the meeting in Port Lincoln also expressed that impacts to fishing operations are of lesser/no concern; the issues regard migration of SBT into the GAB. o Sail line AU3-0950 will not be acquired before March 31st • ION will stand down and move away from towing fishing vessels, maintaining at least 10 km separation distance to avoid any impact to fishing vessels still operating after March 20th Development of the following control measures: • Acquisition will not occur west of Kangaroo Island between Oct 1 and March 20 in any season • Sail line AU3-0950 will not be acquired between Oct 1 and March 31 • Website providing details of survey vessel location and plans • Provide option for text messaging • FLO appointed during activity	
SA Oyster fishery	SA	21/10/14 -Joint meeting with ASBTIA, SA Oyster industry, SA Abalone industry and SA Sardine industry, SA Rock Lobster industry	• Concern over effects of seismic on oysters: • Experienced 50-70% mortality of adult populations at Smokey Bay and Streaky Bay in 2012. 1998 was also a year of high mortality o Unsure of the cause, post mortem were carried out and no evidence of pathogens/disease, or physical damage were found • Concern over the impacts to eggs and larvae the subsequent recruitment into adult population Will respond formally (in writing) to ION	No formal response received - ION will assess any requests made by the oyster fishery on receipt of correspondence. Given location of key oyster fishing areas (Smokey Bay and Streaky Bay) and the expected noise decay towards the shoreline from the survey area, it is considered unlikely that the activity will impact oysters at these locations. Impacts to eggs and larvae discussed in EP (section 4.2) Development of following control measures: • Website providing details of survey vessel location and plans • Provide option for text messaging • FLO appointed during activity	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Scallop Fishermen's Association of Tasmania (SFAT) (previously Scallop Fishermen's Association of Tasmania (TSFA))	TAS	17/07/2014 – letter reply and email	Main points of concern include: • Suffered significant losses of scallop stock from previous surveys • Evidence suggests repeated seismic activity may cause scallops to take flight with repeated startle responses leading to delayed	Face to face meeting held prior to survey (see below) Location of scallop areas fished requested, SFAT advises of general scallop fishing location through DPIPWE and AFMA, noted that these have already been sourced from the website	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			mortality • Impacts on scallop spat and juveniles is unknown • Jan – March is peak settlement period for scallop scat, seismic activity during this time would severely damage or destroy future scallop resource • Anecdotal evidence of dead scallops off Victorian coastline over 40 years, fishers believe due to seismic • Now opposing all seismic survey that are in or near Tasmanian or Bass Strait scallop waters • Party would accept offer to meet and discuss further	and consulted prior to the recommendation from SFAT. Concerns of seismic impacts to scallops (adult and larval stages) have been considered and assessed in Section 4.2 and 4.3. ION responded with full written response to issues raised: • Provided a summary literature review of the impacts on marine seismic surveys on scallops (Section 4.2 and 4.3) • Provided proposed mitigation measures o Face to face meetings with VSFA to discuss further mitigations such as avoiding target areas for settlement, and understanding location of key fishing areas to reduce potential displacement of fishing vessels. o Website to provide daily updates of vessel location o Engagement of FLO who will have personal experience with the fishing industry in the region and will act as a focal point for stakeholders in the period leading up to and during the survey. o Use of a support vessel will be utilised to scout ahead of the survey vessel to manage potential interactions with other marine users. • ION also encourages fishermen to identify specific areas of high importance within the designated fishing zones, and thus further precautions can be discussed between interested parties within these specific areas. • ION noted that additional face-to-face meetings to discuss further would be welcomed; ION will be in touch in the near future to make arrangements.	logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		16/10/14 – meeting held in Melbourne	Points raised If seismic operations are not in 50 m water depths and stick to the lines currently on the map then there shouldn't be any issues with the TSFA provided there are minor changes to the sail lines to keep outside of known scallop beds and to provide a suitable buffer zone.	<u>Actions</u> • ION to provide information on the website showing vessel progress and plans • ION to confirm schedule and survey lines once known • TSFA happy to be included in text messaging group for up to date information on the survey • TSFA to send through map (provided by ION) with annotations of known scallop beds in the area for ION's consideration to avoid (received – ION confirms that the survey will not be in water depths <50m at the locations indicated in the figure) ION to provide confirmation of consultation that has occurred with AFMA and Southern Rock Lobster Fishery: ION can confirm that AFMA, SARLAC and SRL have been consulted. Face to face meetings have been held with both SRL and SARLAC to discuss concerns. AFMA have advised on the active fisheries in the area by letter.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
		5/11/14 – email	Pleased that the ION seismic survey will not overlap known scallop beds as identified to you and that it will be in waters >50m	ION provided following updates 20 November 2014): • Following information provided by fishers that weather conditions can be favourable in May and June; ION has decided to extend the acquisition season from Oct – April to Oct – June (inclusive). • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within a single season. • Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west. The sail lines have been revised and are shown in the attached. Please note that the lines may still change slightly, but are not expected to move more than a few kilometres from where they are currently placed. Note there is also an Area of Interest (AOI) polygon in the Gippsland Basin. 2D sail lines within this area will be placed at a similar distribution to those in the remainder of the survey area.	
		20/11/2014 – email	Requested more detailed map showing water depths around survey lines	ION provided map showing sail lines do not enter water depths <50 m in identified scallop grounds Development of following mitigation measures: • Vessel will not operate in water depths < 50 m in known scallop grounds in TAS • Website providing details of survey vessel location and plans • Provide option for text messaging • FLO appointed during activity	
Victorian Scallop Fishermen's Association (VSFA)	VIC	22/07/2014 - Email	Main concerns include: • Survey area overlaps with scallop fishing grounds, claim that the activity will have long lasting negative impact on function, interests and activities within the Bass Strait • Members raise a formal objection to the proposal and request further and detailed information on all activities Email request for further information: • The 'shapefile' of the survey area • Proposed schedule of works for the activity • Full verified description of the acoustic source/s to be used within the survey (including make and model) detailing sound source level and frequency of the unit, number of pulses etc.	Face to face meeting held prior to survey (see below) Shapefile of sail lines and survey area sent Concerns of seismic impacts to scallops (adult and larval stages) have been considered and assessed in the impacts description. ION provided full written response to issues raised: • Provided background and rationale behind survey plan, parameters and schedule (section 2). • Discussion of potential impacts: o Direct effects of underwater noise disturbance on target populations, including literature review of impacts of seismic on scallops (section 4.2 and 4.3) o Restriction of access to fishing grounds due	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			• Information pertaining to the technical methods and procedures including a schematic of the apparatus to be used • Identification of any potential impacts to the Victorian Scallop Fishery, Bass Strait Central Zone Scallop Fishery and the Tasmanian Scallop Fishery, functions, interests and activities as documented within the Environment Plan • Identification of potential impacts to scallops, Pecten fumatus, within the area and surrounds as documented within the Environment Plan • Clear identification of the mitigation controls to be used to avoid behavioural and physiological disturbance to the valuable scallop stocks within the area and surrounds • Identification of references used to determine risks to scallop species within your Environment Plan and provision of these references Following provision of this info, VSFA will submit a formal written response. Specific areas fished in order to mitigate requested, general area provided. Would welcome face to face meeting.	to vessel movements and operations (see below mitigation measures) o Loss of fishing gear e.g. buoyed traps. Not an issue due to dredge being preferred industry method. • Provided the following mitigation measures o Face to face meetings with VSFA to discuss reducing displacement of fishing vessels and avoiding target areas for settlement o Website to provide daily updates on vessel location o Engagement of FLO to act as communications focal point with details available on website o Use of a support vessel to act as a scout to manage potential interactions with other marine users. Developed additional mitigation measures: • Website providing details of survey vessel location and plans • Provide option for text messaging • FLO appointed during activity ION will assess any requests made on receipt	
		14/10/2014 - Meeting held in Lakes Entrance	• Seismic survey will be around time of peak spawning, unknown what water depths spawning occurs in and impacts could result in scallops establishing elsewhere • As research is not yet published, would ION wait until the FRDC assessment is complete before commencing survey? • No current mitigation measures to manage impacts on scallops from seismic • What are the impacts from vibration on scallops as they are in the sediment? Fisheries Liaison Officer needs to be trusted by the fishermen and understand the culture	• ION to provide information on a website showing vessel progress and plans • ION to confirm schedule and survey lines once known • ION to provide footprint of sediment vibration if possible • ION to provide footprint of acoustic source • ION to confirm water depths in which they will acquire data • ION to research if there is any study completed on vibration impacts on scallops in the sediment from reverberation • VSFA happy to be included in text messaging group for up to date information on the survey • VSFA to confirm the format required for the shapefile of survey area for her system • VSFA to confirm when the FRDC study will be completed for ION to consider their timing • VSFA to recommend Fisheries Liaison Officer • VSFA to provide summary of proposal to Hibiscus, ION keen to consider if they can support or perhaps support a different proposal Is it possible for VSFA to overlay known scallop bed fishing	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				areas on ION's map to provide information on areas to avoid?	
		27/10/2014 – email	VSFA awaiting provision of footprint detail, for the sediment vibration and acoustic impacts from previous work Awaiting ION feedback to finalise response (see below for consultation re source directivity details)	ION provided full meeting notes and details of the seismic source on 4/11/2014 (see above for meeting actions)). ION requested maps showing scallop beds in the survey area as ION have committed to staying in water depths >50 m in these areas in TAS and can do the same in VIC if information provided. ION provided following update on the 20/11/14: • We are now on v8 of the sail lines – attached is a map showing the revised survey lines (red lines show the most recent version). Please note that the lines may still change slightly, but are not expected to move more than a few kilometres from where they are currently placed. Note there is also an Area of Interest (AOI) polygon in the Gippsland Basin. 2D sail lines within this area will be placed at a similar distribution to those in the remainder of the survey area. • Following advice from fishermen, ION has extended the acquisition season to June 30 to allow acquisition in what was previously considered poor weather window. • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within a single season. Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west	
		01/12/2014	Acknowledged receipt of source directivity details and requested 'Vibration Footprint' detail	ION state that directivity plots supplied to VSFA on 4/11/2014 are the closest analogous item available and that there is no measurement for a 'Vibration Footprint'. ION to seek further advice from the geophysics community.	
TARFish	TAS	25/07/2014 – Email	Requested closing date for any comments/feedback requested	Advises that ION would appreciate all responses by the 13 of August 2014 No further response received	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Lakes Entrance Fishermen's Co-operative Society Ltd (LEFCOL)	VIC	28/07/2014 – email	• LEFCOL is strongly opposed to any Marine Seismic surveys given the potential impacts on the Seafood chain • Currently GeoScience Australia is undertaking independent analysis of existing fishing catch/effort data and seismic survey operations in the Gippsland Basin to understand if any correlation exists between the two. Until this is completed no Seismic surveys should be carried out • Further research is required to confirm that Seismic does not	Official ION letter sent to stakeholder addressing concerns: • Informed no seismic activity would be carried out until the EP, including the risk assessment, has been accepted. • Provided further detail about survey plan and theory behind methods used. • Provided summary of available literature investigating the effect of seismic activity on	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			impact on various age classes, spawning events and food sources • Request that ION also postpones any activities until the research is completed otherwise undertake full independent research to confirm that the Seismic work will not impact on Fish Stocks in any way	potential target species including invertebrates, (sections 4.2, 4.3 and 4.4) and as such population level effects are not expected. • Provided mitigation measures o Soft starts and low speeds o Face to face meetings to ensure sufficient stakeholder consultation o Website with a contact page providing real time locations and planned movements o Use of a support vessel to scout ahead and manage interactions with other marine users • Informed ION would not be compensating for perceived loss of catch due to unsupported claims of seismic impacts. • ION encouraged fishermen to identify specific areas of high importance within the designated fishing zones, and thus further precautions can be discussed between both interested parties within these specific areas • ION offered willingness to facilitate face to face meeting (see below)	
		14/10/2014 – Joint meeting held Lakes Entrance Fishermen's Co-operative Society Limited (LEFCOL) and South East Trawl Fishing Industry Association (SETFIA)	Summary of Concerns Raised: • LEFCOL concerned that seismic in the horseshoe area in the Bass Strait at time of year where scallops are spawning could lead to impacts, vessel presence not such a concern • LEFCOL concerned about impacts on all fisheries (shark, gillnet, scallop) • Past experience with some Fisheries Liaison Officers has not been acceptable, others can be recommended. Care must be taken in selecting an appropriate person who the fishing industry trust.	• ION to arrange (likely with SETFIA, see below) to send text messages to all fishermen in area who wish to be informed of vessel movements including co-ordinates upon commencement of survey • ION to provide information on the website showing vessel progress and plans • ION to confirm schedule and survey lines once known ION provided summary notes of meeting on the 18/11/14 and included update of survey details including updated sail lines and survey timing, comments received from LEFCOL and accepted by ION Development of following mitigation measures: • Website providing details of survey vessel location and plans • Provide option for text messaging to provide daily update of co-ordinates of survey vessel • FLO appointed during activity	
South East Trawl Fishing Industry Association (SETFIA)	VIC	18/07/2014 - email	SETFIA proposes ION funds the following four work streams: • A review of Commonwealth and State managed fishing effort (all methods) in the area, any seasonality, a description of fishing gear and how it is worked, perhaps extending to interviews with fishermen in the area about their operations • Liaise with fishermen prior to the survey to warn them it is	ION provided full written response to concerns raised: • Described work streams of stakeholder engagement strategy o A review of State and Commonwealth fisheries within and in proximity to the survey area o Ongoing communications with fisheries	Ongoing engagement, including meetings, for instance meeting to discuss SMS logistics to send updates to fishermen Ongoing stakeholder notifications to be issued for commencement

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			coming. This is an opportunity for fishermen to ask questions and to work through the logistics of how the seismic and watch vessel will communicate with fishing vessels and safety zones • Text vessels during the survey updating them about the start of the survey, its current position and work underway and finally the end of the survey • Contact fishermen to complete a review of how the survey affected them ION also invited to provide article in monthly e-newsletter in which an article on the survey. Raised following concerns: • Short and long term effects of seismic survey on fish stocks • Short term affect, supported by research, is that fish move away from the seismic activity • Major blue grenadier fishery off western Tasmanian each winter • Seismic activity in this area at that time of the year might reduce catch rates for this stock potentially seeing it unable to pay its cost recovered levies • Commonwealth fisheries in Australia are managed using scientific stock assessments that use catch rates collected during commercial fishing as well as surveys collected outside of commercial fishing. A seismic survey would potentially reduce catch rates on these surveys meaning that quotas would be set using negatively biased science and that these quotas might be lower than they biologically should • These surveys include: • A bi-annual fishery independent survey scheduled for winter 2015 • A yet unscheduled acoustic survey of stocks of blue grenadier off Tasmania's west coat • A yet unscheduled acoustic survey of stock of orange roughy of Tasmania's east coast	regarding the survey to be incorporated into the EP o Survey specific website to provide real time vessel location updates and proposed movement updates. Contact details of FLO will be provided. • Provided rationale behind survey parameters, schedule and logistics (section 2). • Provided literature review on the potential impacts to the blue grenadier fishery (sections 4.2, 4.3, 4.4 and 4.5). • ION described lack of information regarding stockassessment methods and requested further information if available to further assess the risk posed by the seismic survey. • ION requested further information regarding the location and timing of the orange roughy survey. • Provided further information regarding mitigation measures. o Soft starts and low speeds o Stakeholder engagement strategy (see above o Use of a support vessel to scout ahead and manage possible interactions with other marine users.) • Offered face to face meeting upon request ION will consider article in SEFTIA newsletter once survey details confirmed	of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		14/10/2014 – Joint meeting held Lakes Entrance Fishermen's Co-operative Society Limited (LEFCOL) and South East Trawl Fishing Industry Association (SETFIA)	Summary of Concerns Raised: • Limited time to compile full proposed SETFIA fishing industry report ahead of commencing survey in December • Independent fishing survey conducted every 2 years usually in December, concerned if survey will overlap, however ION's survey not planned to coincide • Past experience with some Fisheries Liaison Officers has not been acceptable, others can be recommended. Care must be taken in selecting an appropriate person who the fishing industry trust	• ION to arrange (likely with SETFIA) to send text messages to all fishermen in area who wish to be informed of vessel movements including co-ordinates upon commencement of survey • ION to provide information on the website showing vessel progress and plans • ION to confirm schedule and survey lines once known • SETFIA to provide proposal for fishery status report • ION to review proposal and perhaps undertake a	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				staged approach as likely to start the survey in the West, therefore would get that part of report first	
		17/10/2014 – 18/11/2014 Email	Rather than lock horns with seismic proponents SETFIA has tried where the proponent is agreeable to find ways to minimise the effects of seismic surveys on the entire (State, Commonwealth, all sectors) fishing industry. This is achieved through a systematic and staged process that answers pre-agreed questions. With regard to this survey's location and for its proposed summer timing these questions would be: 1. Which sectors fish in the area by month? 2. How do these sectors fish? (this would consider fishery closures and MPAs) 3. What is the intensity of this fishing effort by month? 4. What (if any) fishery surveys are planned and when? 5. What migrations of fish or fish spawning might occur and when? 6. Considering the nature of the fishing method what mitigations, including timing, the removal/modification of lines and other actions might be taken to reduce effects?	1, 2, 3, 5, and 6 are assessed in the EP submitted to NOPSEMA for assessment (sections 3, 4 and 5) Question 4: ION will endeavour to work with fishing surveys planned during seismic acquisition, Simon Boag has previously advised that: • A bi-annual fishery independent survey scheduled for winter 2015 • A yet unscheduled acoustic survey of stocks of blue grenadier off Tasmania's west coat • A yet unscheduled acoustic survey of stock of orange roughy of Tasmania's east coast ION provided update of summary of meeting on the 18/11/2014 (which was edited following comments from LEFCOL, see above), provided updated details of sail lines and timing and requested proposal for scope of work.	
		20/11/2014 – 13/1/2015 Email	• SETFIA sent survey updates by ION who inform of survey plan to focus on the western area for Dec – March, central area for Feb – April, then western area March – June and suggest a more focussed report. • SETFIA responded with following proposal: • To lodge data requests with SA, Tasmania, Vic and the Commonwealth to determine by five relevant reporting that are natural fishery divisions (i.e. eastern Bass Strait, Bass Strait, WC Tasmania, Otway Basin and west KI); the fisheries, value and catches by calendar month averaged over the last 5 years. • To report this data (1) to you in a draft and then final report in a way that allows you to consider when you will run your survey. • To describe the fisheries (method, gear, target spp, ports of domicile, manoeuvrability etc) • Port visits to the identified ports and one on one communication with a cross section from fishers identified. Report on these conversations with recommendations on how to minimise the survey's affects.	ION considers enough information has already been assessed to understand fishing effort in the area via consultation with relevant stakeholders and that this extra proposal is excess to requirements. ION has assessed the scope of work once received and replied (email: 15/01/2015)	
		01/05/2015 email	• Voiced concerns relating to an undisclosed incident relating to a seismic vessel: 1. There was an incident two weeks ago in which a seismic vessel arrived in the fishing grounds. The Association knew it was coming but the proponent had told us they would advise of exact timing and failed to do so. 11 vessels had a day's fishing interrupted and any goodwill that existed between the fishing and oil/gas industries is now extinguished. We continue to be very concerned about the interruption to fishing that your survey will cause. If fishermen know exactly where/when the survey is occurring	• ION responded via email: 1. It is the intention of ION to be completely transparent with all stakeholders, in regards to both location and planned route of the survey vessel. ION will circulate finalised details of the survey 3 months prior to commencement and remain open to consultation and discussion as detailed in the 01/05/2015 notification. 2. These details will be available on the website link as circulated to all stakeholders in subsequent notifications, including coordinates, commencement date and planned	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			they can plan maintenance and perhaps even fish in other areas or to other ports. 2. To be very clear about what we would like from ION; the Association's expectation is that you, as the proponent, will advise the Association (me) a month, then a week, then and a day before the survey begins, as it happens and when it is finished. You will provide me with detailed (coordinates) areas of operation. 3. I will SMS the fleet three times (month/week/day before) as well as during if your timing changes and then when it is finished. You will email or SMS this to me in a timely manner and confirm this verbally if I do not respond. 4. Regardless of notices to mariners unless this happens I suspect that you will find that some fishermen may refuse to give way. 5. We note that you have chosen not to conduct face to face discussions with fishermen or identify affected sectors. We understand that SETFIA's proposal to do so was costly given the size of your survey. Our default position would be that SETFIA and ION work together to limit effects on just the trawl fishery. 6. Would it be possible to meet to determine: i. Where your survey will operate, there are sub-areas within the fishery ii. Which trawl vessels work in these sub-areas iii. Contact lists for these vessels 7. I do find myself wondering why the Association is proposing to conduct this work for no fee but the alternative is an at-sea show down between your watch vessel and fishing vessels in which your survey will be interrupted and/or fishing vessels will be prosecuted. 8. It would be my preference to have a human at ION to liaise with and not a consultation address.	vessel route. The website will be live at least 2 weeks prior to the start date and updated with any changes prior to the survey changes taking place. It will be the stakeholders responsibility to refer to the website for further updates of the survey. 3. These details will be available via the website and consultation notification sent 3 months prior to commencement. The website will always be prioritised for up-to date information to ensure that all stakeholders are informed of all changes rather than individual stakeholders targeted with specific SMS. 4. A scout vessel, and FLO(s) and will be available throughout the survey period to liaise with fishermen and any possible concerns raised 5. It has always been IONs intention to work together with SETFIA to ensure a safe and successful survey for both parties, while ensuring limited disturbance to both parties. 6. Meetings can be arranged. The exact survey details are not yet finalised, it would perhaps be most appropriate to meet following the 3 month notification. 7. This is not IONs intention, and assuming neither the Associations intention. 8. A consultation address has been used to ensure all stakeholder responses are collated in one place and individually addressed, this also ensures that all consultation correspondence is provided to the Regulator (NOPSEMA) during assessment and potential audits. Face to face meetings with Steve and yourself, notifications, correspondence, including phone contact details (refer to 01/05/2015 notification) have been provided throughout the preparation of the proposed survey and Environment Plan. In which the named contact at ION (Steve Pickering) has been a part of all consultation.	
		05/05/2015 email	• 1. I am proposing that ION (with SETFIA's assistance) needs to SMS vessels/operators during the survey; 3 months, 1 month, 1 week, 1 day, during and then when ended. The level of detail required is what/where the survey vessel will be doing daily. • 2. I do not believe that all fishermen will check the website but some might. If it contained the above level of detail it might work. I could simply SMS a link. • 3. If you are relying on the scout vessel to "liaise" with fishermen you have failed. The fishermen should, have vacated the grounds. Fishing vessels have varying degrees of immobility. • 4. I remain concerned that given the fleet's general dislike of seismic surveys and the vent of 17 April that fishermen are in a fighting mood and will likely stand their ground. Obviously this	• ION responded via email: 1. Through SETFIA's advice, ION is aware that SMS will be very useful for the fishermen. Logistics of SMS to fishermen can be discussed during the meeting. 2. The website will contain detailed information as required from stakeholders, such as vessel location. 3. It is not IONs intention for initial liaison through this method. Liaison with fishermen prior to survey commencement, such as website, FLOs, SMS and contacting key members of fishing parties, such as yourself should negate this. The scout vessel will have many duties, including liaising with fishermen at sea if required. 4. It is not IONs intention for initial liaison through this	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			attitude is silly but it has been driven by an apparent disregard and/or lack of understanding by seismic Coys of fishing as a business. The suggestion that the scout vessel will "liaise" with fishermen at sea – having to haul your fishing gear and being ordered from the grounds is not liaison. • 5. Very keen to meet and discuss.	method, as described above. 5. Meetings can be arranged. ION will get in contact closer to the time when details of the survey have been confirmed, thus allowing more effective and informed decisions (ION called to discuss, see below). ION will utilise the following control measures: • Website providing details of survey vessel location and plans • Provide option for text messaging • FLO appointed during activity	
		13/05/2015 – phone call ION to SETFIA	• Reasserted their disappointment in the GA vessel turning up announced • Asked that the following update schedule be in the EP for notification of the survey 3 Months/ one month/ 1 week/ 1day/ daily	• ION would endeavour to keep to that schedule • Agreed to mutually touch base in August for the next update	
Portland Sports Fishing Charters	VIC	02/09/2014 - email	• Request further details on the survey to be conducted this November to the south of Apollo bay and west of King island as it may affect PSFC fishing operations • Request a detailed map including coordinates, including turning areas would be appreciated	Advised that the schedule, dates and locations have not yet been confirmed. However ION advised that this requested information, including maps will be provided on a website, in which details will be circulated in due course Notification letter outlining updated information provided on the 14/11/2014 Developed the following control measures: • Website providing details of survey vessel location and plans • Provide option for text messaging to communicate daily updates • FLO appointed during activity	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Government					
Australian Marine Safety Authority	National	15/07/2014 – email	• AMSA is the designated control agency for oil spills from vessels within the Commonwealth jurisdiction • Upon notification of an incident involving a ship (which is a requirement on the ship's master), AMSA will assume control of the incident and respond in accordance with AMSA's Marine Pollution Response Plan • As such AMSA does not require consultation on OPEPs for seismic survey, nor do we review or provide feedback on such plans	Noted and incorporated into EP where relevant	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Department of Defence - Directorate of Property Acquisition, Mining and Native Title Infrastructure Division	National	21/08/2014 – email	Advises that: • The area of the proposed activities potentially involves the South Australian Exercise Area (SAXA). • Correspondence with Navy suggests that SubOps don't have any issues with the mutual activities within the areas and will de-conflict their movements with ION. To allow this Defence requests that ION submit and operate on a Notice of Intention to SubOps.	Notifications to the Department of Defence will be adhered to Risks of potential UXO in the survey area understood	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			• Furthermore, Defence requests a Point of Contact at ION to facilitate liaison with SubOps. Letter received advising that: • Proposal is within South Australian Exercise Area and Restricted Airspace R282 • Therefore ION will need to liaise with DoD to ensure proposed activities do not conflict with training activities • Department of Defence requires a minimum of 7 days advanced notification of any seismic surveys, notifications will be sent to: • Submarine Operations, SUBOPS.SUBCON@defence.gov.au, • Joint Airspace Control Cell ADF.Airspace@defence.gov.au, • Australian Hydrographic Office hydro.ntm@defence.gov.au Unexploded ordnance (UXO) may be in and on the sea floor within the survey area, and all survey activities within the survey area will be conducted at IONs own risk		
		9/12/2014 - email	Response to survey updates sent on 14/11/2014 and advise that the initial response has not changed.	Noted	
National Native Tribunal	National	24/07/14 – email	National Native Tribunal feedback includes attachments to show there are no current or pending native title claims within the proposed survey area.	Noted	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Geoscience Australia	National	18/07/2014 - email	General comments include: • Geoscience Australia is proposing to acquire 2D seismic data across a large area of the southern Gippsland Basin during March-April 2015 • Keen to discuss your permitting schedule and stakeholder interactions • Stakeholder engagement proved a difficult process • Include CarbonNet on stakeholders list Request to meet 4/09/2014. As a broad proposal, keen to know more about your timelines for public engagement so we can best adapt ours to avoid stakeholder confusion or stir up unnecessary negative attention.	Proposed Geoscience Australia survey area noted. CarbonNet were consulted as a result of feedback from Geoscience Australia	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		4/09/2014 – meeting	Meeting held to discuss permitting schedule and stakeholder interactions • No issues were raised regarding the impact of the proposed survey on Geoscience plans • Geoscience provided insight into VIC stakeholders and advised meetings be held with industry representatives • Geoscience advised that they are conducting two studies to investigate how seismic impacts fish and fisheries. These are in peer review and ION will review information when publically available Geoscience requested shapefile of sail lines	• ION provided sail line shapefile on 5/9/2014 ION will await release of studies and assess if any new risks are raised as part of ongoing environmental plan review.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
		18/07/2014 - email	General comments • Requesting shapefile of survey area • Query in regards to date responses are due	Shapefiles provided for the survey area Advised that ION would appreciate all responses by the 13 August 2014 so all feedback can be included in the EP for submission to NOPSEMA	
Department of Environment, Water and Natural Resources (DEWNR)	SA	21/08/2014 – email 1/10/2014 - email	Letter received from Breton Grear with feedback: • Proposed survey area is adjacent to a number of marine parks, including sanctuary zones. • Advised of Marine species recorded adjacent to the marine parks which may be affected by the proposed activity, these species include: • Blue whale – aggregation areas • Southern right whale – pathways • Humpback whales • Australian sea lions – foraging • Southern elephant seal • Minke whale • Pygmy right whale • Short-finned pilot whale • Southern bottlenose whale • Pygmy sperm whale • Dwarf sperm whale • Sperm whale • False killer whale • Porbeagle • Shortfin mako • Great white shark • Australian grayling • Support IONs adoption of the EPBC Act Policy Statement 2.1 to minimise the impacts of operations DEWNR encourages company to complete activities before southern right whale migration commences in May	Sensitive receptors as highlighted in the EPBC search and species with a likely presence in the survey area have been noted and included within the plan (Section Error! Reference source not found.), and risks have been assessed (Section Error! Reference source not found. and 5): • Blue whale – aggregation areas • Southern right whale – pathways • Humpback whales • Australian sea lions – foraging • Pygmy right whale • Sperm whale • Shortfin mako • Great white shark • Porbeagle • Shortfin mako For other cetacean species (not EPBC listed: minke whale, pygmy right whale, short-finned pilot whale, southern bottlenose whale, pygmy sperm whale, dwarf sperm whale and false killer whale) the implementation and mitigation measures to be undertaken during the 2D survey is considered to reduce risks to these species to ALARP, given their status no further measures were considered necessary. The Australian grayling is primarily a freshwater fish species and rarely inhibits saline waters, therefore ION consider the presence of these species highly unlikely in the survey area. However impacts to fish species have been detailed in Section 4. The southern elephant seal is listed as vulnerable under the EPBC Act. However the presence of the southern elephant seals within the survey area is considered highly unlikely. The closest location for possible sightings of southern elephant seals in relation to the survey area is Maatsuyker Island, south Tasmania (outside of the survey area), and even here sightings are rare with less than 4 per year. However potential impacts to pinnipeds have been discussed in Section 6. Given their highly unlikely presence, no further measures were considered necessary. ION will adhere to part A EPBC Act Policy Statement 2.1, and part B with the use MFOs and PAM. Invited DEWNR to face to face meeting. DEWNR unable to	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				attend and agree that points raised in feedback do not require detailed discussion.	
		14/11/2014 – revised scope notification	Advises ION previous comments are still relevant	Noted	
Energy Resources Division, Department of State Development (DSD) (Previously DMITRE)	SA	10/07/2014 – email, 18/07/2014 - email	General feedback: • Requesting shapefile for survey area and sail lines • David Cockshell happy to be the main contact for the State Department • Coordinates provided are 'vintaged' and may create challenges • Sail lines traverse into state waters and marine parks • Advises that PIRSA Fisheries and City of Port Lincoln need to be contacted • If no air gun discharge then no state approvals will be needed	Shapefile and of survey area and sail lines sent Sail lines amended so they do not traverse into state waters and marine parks PIRSA and City of Port Lincoln consultees were noted and confirmed that they were contacted prior to this correspondence Seismic source will be shut down in state waters	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		8/10/2014 – joint meeting with SARDI, DSD and CSIRO	• Summary of points discussed in discussion: • ION confirmed that the survey will cover new areas and use new methods providing new data and information. • Discussed the issue of stakeholder saturation with multiple seismic surveys planned for the area this season. Agreed that this is a difficult issue but possible eased by ensuring consultation is transparent and providing stakeholders with updates when available • No objections raised to proposal	ION provided latest sail line shapefile in WGS84 ION developed following control measure: • Seismic source will be shut down in state waters	
		14/11/2014 – email	Request for v6 and v8 sail line shapefiles	Shapefiles sent 17/11/14	
South Australia Research, Development Institute (SARDI), Commonwealth Scientific and Industrial Research Organisation (CSIRO)	SA/National	8/10/2014 – joint meeting with SARDI, DSD and CSIRO	• Discussed stakeholder concerns regarding impacts of seismic on larva/eggs. • SARDI agreed that there is limited information surrounding the impacts of seismic on target species and catch rates. • Agreed that due to the environmental conditions in the area there is also a lack of information regarding the spatial distribution of larvae or locations of key spawning or settlement areas. • Discussed potential to engage in environmental monitoring. SARDI seeking vessel for benthic and pelagic sampling in BP's permits (EPP 36, 38 and 39). Other options could include engaging with IMOS initiatives or collecting additional data on board the survey vessel, e.g. MFOs collecting data on seabirds. ION will explore options further	• ION will provide details of the vessel once confirmed, unlikely data will be able to be collected during OtwaySPAN given the distance of these sample locations form the proposed survey. • ION provided SARDI with consultation letter including list of stakeholders and map of survey area ION provided SARDI GeoScience Australia contact	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		20/01/2015 Email	• SARDI advise they will be conducting a dedicated boat-based visual and acoustic survey for cetaceans in the eastern Great Australian Bight on the shelf-edge between the 200m and 2000m depth contours in the area approximately longitudes 132.50° E and 136.50°E. The provisional dates for this survey are from 22 April and 7 May 2015. • Requested what seismic activity ION may be conducting in this area during this period – in particular any activity that is likely to	ION sent SARDI both original consultation letter and the revised scope notification letter via email on 3/2/2015 and offered shapefile of latest survey lines. Survey commencement date and schedule will be provided once confirmed.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			overlap in time and space with SARDIs proposed survey, so that SARDI can consider these during planning, with particular importance placed on the area west to south of Kangaroo Island.		
			• SARDI enquired about commencement data and schedule as SARDI will be conducting their survey in due course • Request for shapefile of latest survey area and sail lines	• SARDI were informed: • The ION Geophysical OtwaySPAN 2D Marine Seismic Survey has not yet been approved and no commencements date set • SARDI were informed the survey will not be in operation during the research study • ION will commit to notify all stakeholders 3 months prior to any survey commencement and/or phase should the survey not be completed for instance, as a result of bad weather conditions, in which the latest data will also be presented to stakeholders, such as sail lines • The PGS and TGS seismic survey has also finished and no other seismic surveys operating in the GAB during SARDI survey	
Department for State Development (DSD)	National/ State	3/04/2015 Email	• DSD sent a request to ION to consider re-aligning a couple of the proposed seismic lines offshore South Australia to acquire data over the Humpback Lead (data may interest oil and gas companies). • ION informed DSD that the information was passed on to the program designer and ION will discuss internally.	ION to discuss internally re-alignment of sail lines to aquire data over Humpback.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Department for Planning, Transport and Infrastructure (DPTI)	SA	22/07/2014 – email	Summary Arrangements document amended to summarise SA arrangements accurately for OPEP arrangements	Feedback for OPEP arrangements from DPTI accepted and incorporated into the EP	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		10/12/2014 - email	Notification sent of update to tank size and spill modelling sent	No response regarding this matter	
Regional Development Australia, Whyalla and Eyre Peninsula (RDA WEP)	SA	24/07/2014 – letter	In support of the proposed activity.	Noted	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
City of Port Lincoln	SA	12/08/2014 – email	That Council advises ION Geophysical in response to its correspondence received on 15 July 2014 that: • Council supports and welcomes the establishment of land-based activities associated with the proposed seismic survey work having regard to the local economic benefits • Council supports a preferred precautionary approach to the timing of seismic surveys with respect to the critical growth and fishing season for tuna in or near the survey area and asks that a high priority be placed on this consideration • Council seeks to be further informed of key milestones in the survey and exploration phase, and maximum opportunity to plan	Advised that key stakeholders within South Australia, Tasmania and Victoria (and national) have been identified and contacted as detailed in the original stakeholder letter. Since consultation with these highlighted parties, other stakeholders have been suggested and subsequently added to the list. Face to face meeting was arranged prior to survey to advise party of step by step processed and more detail information of proposed activity. Advised that all fisheries have been consulted, and face to face meetings will be arranged with interested parties.	ION will assess any further feedback received Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			for any longer-term infrastructure and social impacts that may be associated with an ultimate production phase • That ION Geophysical be invited to make a presentation to Council to further clarify and expand on its operations	Furthermore, vessel information, i.e. real time and planned coordinates of the survey vessel, and other relevant information will be published on a website prior to the survey commencement. The website details will be circulated in due course.	
		7/10/2014 –meeting	Discussions included: • Impact of the survey on the tuna industry • Survey line changes • Land based activities • Port Lincoln City Council advised that formal response has been provided in line with other seismic proposals.	ION provided following update (20/1/14): • Following information provided by fishers that weather conditions can be favourable in May and June; ION has decided to extend the acquisition season from Oct – April to Oct – June (inclusive). • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within a single season. • Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west. • The sail lines have been revised and are shown in the attached. Please note that the lines may still change slightly, but are not expected to move more than a few kilometres from where they are currently placed. Note there is also an Area of Interest (AOI) polygon in the Gippsland Basin. 2D sail lines within this area will be placed at a similar distribution to those in the remainder of the survey area. ION believe that these changes will benefit the tuna fishery since ION intend to not enter waters west of Kangaroo Island until the end of March. ION to provide summary of meeting, Council will provide additional feedback if required (not expected) ION developed the following control measures: • Acquisition will not occur west of Kangaroo Island between Oct 1 and March 20 in any season • Sail line AU3-0950 will not be acquired between Oct 1 and March 31st	
Kangaroo Island (KI) Council	SA	11/08/2014 – Letter	Requested a face to face meeting and general community engagement Concerns involved sail line overlap with Bight Petroleum	Face to face meeting was arranged prior to survey (see below)	Provide update when EP is submitted/accepted Update for when EP Summary is posted on NOPSEMA website Pre survey notification
		9/10/2014 –meeting	• Summary of concerns: • Kangaroo Island council indicated that they are not opposed to the survey but expect high level of environmental standards in conducting the survey	Await formal response from KI council to address concerns raised (see written response below) Concern about hydrocarbon spill noted and considered during formation of relevant performance standards.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			• Success of KI economy based on environmental integrity • Any hydrocarbon spills will result in high costs to KI community • Provided booklet "Seismic Seas" outlining how council view good environmental impact assessment and stakeholder consultation • Concerned about impacts to cetaceans • KI council raised potential for moving sail lines away from KI to prevent future O&G activity in the area • KI council said they would provide written response with feedback in due course reflecting discussion of meeting		Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		15/10/2014 – letter	In addition to concerns raised in meeting: KI Council request that 8 MFOs are hired, on a 6 hour rotation and transparently report findings to DoE Request a buffer zone around the island, 100 nautical miles west and 50 nautical miles south as this will discourage further 3D testing and future oil and gas activities	ION provided written response on 20/11/2014 addressing concerns of meeting and formal response: • ION can confirm that PAM and MFOs will be used throughout either part or all of the survey depending on the biological importance of the area for cetaceans o individual MFOs will be used in the survey in total (2 observing at any one time, therefore 4 on vessel, additional 4 on next crew swing) o ION can confirm that all MFO findings will be reported to DoE • ION consider the buffer zone around KI not practicable and provided rationale for distance between survey lines and Kangaroo Island o Survey conforms to Exploration Permit and, o Detailed environmental risk assessment, o Use of mitigation measures, o Explanation of unlikelihood of IONs influence in future petroleum activities. o The survey lines are being finalised and an acquisition plan (the order in which the lines will be acquired) is under development. ION is happy to provide Kangaroo Islands Council with this information as it becomes available. • The EP is in the final stages of drafting with outcomes of recent meetings with stakeholders (including Kangaroo Island Council) currently being integrated into the document. o The survey commencement date will be dependent in part on the acceptance of the EP but is currently planned for the end of December. • ION also provided the following updates on the 21/11/2014: • Following information provided by fishers that	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				weather conditions can be favourable in May and June; ION has decided to extend the acquisition season from Oct – April to Oct – June (inclusive). • It is hoped that the survey will be acquired all in one season (2014/15) However, the EP will include possible acquisition in a further 2 seasons in case weather conditions are not favourable and the survey cannot be completed within a single season. • Although plans are yet to be confirmed, the intention is to begin acquisition at the end of December in the south east portion of the survey area, completing the activity in May/June in the west. • The sail lines have been revised (map provided). Please note that the lines may still change slightly, but are not expected to move more than a few kilometres from where they are currently placed. Note there is also an Area of Interest (AOI) polygon in the Gippsland Basin. 2D sail lines within this area will be placed at a similar distribution to those in the remainder of the survey area.	
Department of Primary Industries, Parks, Water and Environment (DPIPWE)	TAS	10/07/2014 - email 29/08/2014 – official letter received	Advises no state EP needed The activity occurs outside of state waters and therefore outside of DPIPEWE's jurisdiction. DPIPEWE provides general comments on marine mammals and seabirds potentially in the survey area, including migratory species: • Marine Mammals • Humpback whale – likely presence • Blue whale – likely presence • Southern right whale – likely presence • Australian sea lion – likely presence • Australian fur seals – likely presence • New Zealand fur seals – likely presence • Supports timing of survey as outside period for peak whale migration • EPBC Policy Statement 2.1 should be implemented • Overlap Australian fur seal breeding season, where the majority will be foraging and residing in the Bass Strait • Seabirds • Albatross and petrel are likely to occur in the survey area, particularly shy albatross on Albatross Island • Important foraging area within the proposed survey area for a range of seabirds, including shy albatrosses • Potential impacts to seabirds should be outlined and mitigations to reduce the risk, including light strike which may impact petrels	Marine mammal presence, sensitivities and key timings within the survey area and wider environment have been further described in Section 3.3 and Sections 4.8 and 4.9. Including mitigations to manage the risks they survey may pose, including adherence to the EPBC Policy Statement 2.1 Albatrosses, petrels and other birds presence, sensitivities and key timings within the survey area and wider environment have been further described in Section 3.3 and Section 4.6. External lighting on the survey and support vessel will be minimised where possible, however lighting is required for navigation, vessel safety and safety of deck operations. Section 3.4 gives further section 5 considers impacts to tourism/recreational fishing, state and commonwealth fisheries, fish species and other marine users. ION have previously contacted Scallop Fishermen's Association of Tasmania, Tasmanian Seafood Industry Council (TSIC), AFMA, Tasmanian Association for Recreational Fishing (TARFish) and Tasmanian Rock Lobster Fishermen's Association with a stakeholder letter. ION's approach to stakeholder engagement is targeted, and will address issues, give further details on questions raised. Further information in regards to the vessel will be provided on the website. ION will consider providing the EP to DPIPWE once accepted depending upon confidentiality assurances from DPIPWE.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			and albatrosses • Wild Fisheries Offshore constitutional settlements (OCS) arrangements provide for passing jurisdiction for certain fisheries/species to another jurisdiction in specified waters. Therefore Tasmanian state fisheries extend into commonwealth waters and into the proposed survey area. These fisheries include: • The Southern Rock Lobster Fishery • The Giant Crab Fishery • The Scallop Fishery • The Abalone Fishery • Recreational fishery also extends 200 nautical miles adjacent to Tasmania • Strongly recommend to consult with Scallop Fishermen's Association of Tasmania, the Tasmanian Rock Lobster Fishermen's Association, the Tasmanian Seafood Industry Council, the Tasmanian Association for Recreational Fishing and AFMA • In consultation, suggestions for information could include the physical size of the gear being used, point for potential physical interactions with vessels and fishing gear, and well as possible impacts on fish species DPIPWE would appreciate the opportunity to comment on a draft or final version of the EP once available		
Industrial Minerals, Geothermal and Petroleum Mineral Resources Tasmania, Department of State Growth	TAS	24/07/2014 - email	Advises no state EP needed	Noted	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Latrobe Council	TAS	21/08/2014 – email	Advises they are not relevant to the proposed survey.	Noted	None
DPIPWE - Heritage Tasmania	TAS	16/07/2014 – email	Given that the proposal has no relevance to our agency, we have no interest in attending a stakeholder consultation session	Noted	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
King Island Council	TAS	16/07/2014 – email	Council is aware of the survey and suggests contacting local paper for feedback	ION does not consider it appropriate to contact local paper since all relevant stakeholders have been identified and engaged during the EP process.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
TAS Minister for Energy and Resources	TAS	16/07/2014 – email	General comment in regards to the change of Government, original contact is no longer the responsible Minister.	Responsible ministers thus identified and contacted with the stakeholder letter.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
					logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Minister for State Growth	TAS	05/05/20165 email	Acknowledge and thank you for your email in relation to the proposed timing for the survey.	Noted	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
DPIPWE - Environment Protection Authority Tasmania	TAS	15/07/2014 – 05/08/2014 - email	No response received, email confirmation (15/07/2014, 28/07/2014 and 5/08/2014) that message with be attended shortly for further action EnvironmentEnquiries@environment.tas.gov.au have also been contacted, however no response received	Multiple requests sent for review of summary for publically available TASPLAN information and requests for other contacts to consult with instead However as the TASPLAN is publically available and has been summarised only for the OPEP, it is considered adequate for this vessel based activity	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		10/12/2014 - email	Notification sent of update to tank size and spill modelling sent	Received notification that message would be attended to shortly. No further response received from stakeholder.	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Department of State Development, Business and Innovation	VIC	9/07/2014 – email	Pre-requisites required to ensure that your client is compliant with the various Acts in order for no state approval needed: • The commitment to turn off the seismic source and not to collect data from the adjoining permit must be the subject of consultation with the adjoining tenement holder. • The commitment to turn off the seismic source and not to collect data from the adjoining permit must be the subject of a commitment and performance outcome of the EP to be submitted to NOPSEMA. This commitment may need to be communicated to the subcontracting seismic vessel to ensure that the standard procedures for that vessel can accommodate compliance. • If these consultations and commitments do not raise conflict or compatibility issues, then your client will not be undertaking a petroleum activity in State waters and therefore, would not need an access authority or an EP. The right for ION to acquire data in the tenement holders was queried.	Pre-requisites needed in order for no state approval required, these have been taken on board and incorporated into the EP (section 5). Advised that ION will be applying for the necessary Special Prospecting Authorities (SPAs) and Access Authorities (AAs) from NOPTA prior to the survey commencing. The granting of these permits by NOPTA will mean that ION will be titleholder for the activity under the OPGGS Act. Control measure developed: • Seismic source will be shut down in state waters	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
The Carbon Net Project	VIC	11/08/2014 – email	Concerns include: • The maps and coordinates indicate that the proposed ION survey will traverse through VIC-GIP-001 • Likely timing for the vessel to be in Gippsland • Consents applied for • Technical specifications of the vessel and equipment. Include a meeting or teleconference with us as part of your stakeholder engagement	Face to face meeting held prior to survey (see below) Sent shapefiles of sail lines and survey area and advised that the proposed sail lines do not currently overlap VIC-GIP-001 permit. Advised that a website will be generated prior to survey commencement with real time and planned locations of the survey vessel, including other relevant information	ION and CarbonNet will continue with ongoing consultation and will hold meeting(s) to explore programme synergies if required Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
		15/10/2014 – meeting	Discussions of ION crossing through tenement, not really a concern, just need to know when etc. via permit of ingress letters	• ION to provide information on the website once live showing vessel progress and plans • ION to confirm schedule and survey lines once known including if in Bass Strait • ION to send courtesy data once survey completed • ION to send permit of ingress to CarbonNet (updated ingress email for applicable companies only, i.e. survey overlap of permits, sent from ION on the 6/02/2015; Carbon Net permits not covered) Notification letter with updated sail lines sent on the 15/11/2014	etc. (3 months prior to survey commencement, and each phase)
		1/12/2014 & 9/12/2014 - email	Requested shapefile of sail lines and area of interest.	ION provided latest shapefiles on 9/12/2014	
		9/12/2014	Upon receipt of latest shapefiles advised one sail line is located within CarbonNets greenhouse gas assessment area (Vic-Gip-001) and requested to be kept updated on the survey.	ION will provide survey updates	
		04/05/2015 email	Thanks for your recent notification to us regarding your planned 2D survey in Bass Strait I will be making a presentation at the Australian Emissions Reduction summit here in Melbourne on Wed 6 May providing an update on CarbonNet, please see attached a copy of the presentation for your information. We have been awaiting the outcomes of the Commonwealth GHG acreage process that commenced in Aug last year and are now confident that we will secure additional GHG assessment permits in Bass Strait. I think there maybe value in us having a meeting/teleconference to explore if our work programmes have any synergies. Please feel free to call me to discuss this further as required.	ION will consider CarbonNet's information and will continue to engage with CarbonNet	
Department of Transport Planning and Local Infrastructure	VIC	15/07/2014 – email	Feedback with corrections to VicPlan summary for OPEP arrangements	Feedback for OPEP arrangements from DTPLI accepted and incorporated into the EP	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		10/12/2014 - email	Notification sent of update to tank size and spill modelling sent	No further response from stakeholder	
Parks Victoria	VIC	21/08/2014 – email	First response: • Requests shapefile of the proposed survey area • Could you also please provide some more technical information about the seismic equipment including sound frequencies, noise levels, range etc.? • If you have a more detailed technical report outlining the proposed surveys this would be useful. • If you have any more detailed information about the proposed timing of the surveys in Victoria this would also be helpful. Secondary response: • Concerns over seismic activity to little penguins and their prey	First response: • Survey area and sail line shapefile sent • Advises that website set up with further information, i.e. vessel locations in Victoria • Technical information about a 2D survey in comparison to a 3D survey is provided • As per the requests, ION will maintain a minimum of 1 km survey area buffer around the Twelve Apostles Marine National Park, and can confirm no seismic acquisition will be taken within the Twelve Apostles Marine National Park	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			during breeding season and subsequent foraging to feed chicks, in particular the sail line that comes within 1 km of the seaward boundary of the Twelve Apostles Marine National Park • Therefore request a minimum 1 km buffer around the Twelve Apostles Marine National Park and that seismic equipment is not used inside the park • Also request that the survey to be conducted outside the breeding period for the little Penguins (i.e. not during the period from October to January) OR move the sail line east or west away from the park boundary so that the sail line is well away from the little penguin foraging area. • Possible risk of marine pest introductions - what measures is ION taking to minimise the risk of marine pest introduction during the surveys?	Second response: • ION provided updated information including location of sail lines and acquisition plan commencing in the west in December and completing in the west in May/June. • Given the change in acquisition plan ION are able to avoid acquisition within little penguin BIAs or along sail line AU3-6600 from Oct 1 – Jan 30 ION provided a copy of an outline of ION controls in place to minimise risk of introduction of IMS	
		26/11/2014 - email	Pleased with outcome of secondary response	No further action necessary	
NGO / Research					
Blue Whale Study Inc.	National	01/08/2014 - email	Email request to add Blue Whale Study Inc. to the stakeholder list	Request noted and stakeholder letter sent	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		05/05/2015	Asks for advice of survey area Are ION aware aware that blue whales feed in the Otway Basin between November and May	Previous notifications sent Advised that ION has completed extensive research in the survey area to ensure all environmental sensitivities are highlighted, particularly for whales (section 3.3). Appropriate mitigation measures have been developed to ensure risks reach ALARP. These mitigations will be available in the EP summary (sections 4.8 and 5), a link to this will be provided in due course (and will be publically available on the NOPSEMA website).	
International Fund for Animal Welfare (IFAW)	National	21/07/2014 - email	General comments include: • IFAW has a number of concerns about the proposed activity and how it relates to our interest in seeing marine life protected from the impacts of seismic surveying • IFAW will provide comments as soon as possible and would like any additional information as it becomes available	Awaiting further comment from IFAW (see below)	Conference call if required by IFAW Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		06/08/2014 - letter	IFAW provided letter outlining concerns regarding: • Impact of the survey on listed threatened, migratory and cetacean species • Baseline ecological data collection • Mitigation measures • Noise modelling data • Cumulative impacts • Alternative technologies	ION provided letter addressing concerns raised: • Provided rational for survey timing o Environmental impact, disturbance to other sea users, cost, survey duration streamlining. • Provided rationale behind assessment of both risk to cetaceans arising from survey parameters, and ALARP (section 4.8 and 5). • Provided a summary of expected whale presence supported by literature (section 3.2 and 3.3). • Provided detail on proposed control and adaptive management measures to reduce potential impacts to cetaceans (sections 4.8 and 5). • Provided rationale and outcomes of control measures (section 5).	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				• Provided a summary of the potential for cumulative impacts from multiple seismic vessels (section 4.10). • Provided a summary of the merits of using alternate survey technologies. Notification providing details of updated survey timing and sail line position was sent on the 15/11/14	
		25/11/14 - email	• Acknowledge receipt of the changes made to the sail lines and survey timings for the ION Geophysical 2D survey. • IFAW would like to reiterate the serious concerns outlined in our response dated 6 August 2014, for which we are still awaiting an official response from ION. • IFAW would like to express additional concern over the proposed extension of the survey season until the end of June. Extending seismic surveying into the months of May and June means that the proposed survey will certainly coincide with the arrival of endangered southern right whales, migrating to their calving grounds off the coasts of Victoria and South Australia. • IFAW requests that ION fully explain how southern right whales have been considered in the plans for this seismic survey, to enable us to give informed feedback about how the proposed activity impacts on our interest of seeing marine life protected from noise pollution. • IFAW also requests that ION provide a full response to our previous requests and questions at least 28 days before the anticipated start date of December 2014, in order to allow adequate time for us to review the documentation and respond accordingly.	• ION responded to IFAWs initial concerns on the 26 September 2014 • ION provided IFAW with the same response • Additional mitigation measures for southern right whales are included in the EP (section 5.4), details of the seasonal buffers around known calving sites will be provided to IFAW	
		13/01/2015 Email	• IFAW reiterate concerns with the proposed survey and how the activity impacts on their interest of seeing marine life protected from noise pollution, specifically: • Survey timing and multiple years • Extension of the survey from May to June • Cumulative Impacts	ION provided response addressing each concern raised via email on 06/02/2015 In summary the response: • Clarified survey timing as per section 2.2 • Informed that the timing of the survey have been extended from May to June after extensive consultation with the local maritime industry and assessment of historical trends of practical sea states. This extension provides greater opportunity for ION to complete acquisition in one season (i.e. without having to come back next year) • ION notes that migrating southern right whales and pregnant females, sperm whales, blue whales and other cetacean species may be encountered during the survey and critical habitats for these species have been considered. Mitigations for these sensitive receptors (and others) are in place to ensure the potential risks from the survey are reduced to ALARP (see Table 1 in attachment), other mitigations include: o Use of PAM (passive acoustic monitoring) o No acquisition within BIAs for southern right whales	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				o No acquisition within 70 km of southern right whale breeding areas from May and June (inclusive) o Acquisition taken outside peak sperm whale feeding periods (August – September) o Blue or sei whale observed foraging within the observation zone (3 km) the source will be shutdown o Simultaneous operating survey vessels (if present) will not occur within at least 40 km of one another o Seismic source will be shut down in State waters (Please note ION would welcome suggestions of further mitigations to consider) • ION are aware cumulative noise may increase the risk to sensitive receptors. In order to manage other seismic surveys that may occur within the survey area at the same time, ION will consult with other seismic providers and will maintain a 40 km distance of other operating seismic survey vessels, or 50 km in the case of the Nerites survey vessel (as requested). • Ion provided details of seasonal buffers for southern right whales on 06/02/2015	
		01/05/2015	• Response from IFAW: 1. As with the ION's suggested mitigation measure for southern right whales, IFAW recommends that no seismic survey acquisition takes place in blue whale BIAs during the blue whale presence period of November to May. 2. As a minimum requirement, aerial surveys should be undertaken prior to commencement and throughout the duration of the seismic survey to determine whether blue whales, southern right whales and other cetacean species are present in the survey area. Not only would this allow ION to direct survey effort away from cetaceans, it would also allow for scientifically valid data to be obtained about cetacean activity in the area prior to seismic surveying. Previous seismic surveys conducted in the Otway Basin had a number of conditions applied by the Environment Department in order to protect blue whales. For example, the Origin Energy 'Astrolabe' survey (EPBC referral 2010/5700) included blue whale and krill aggregation observations (aerial and vessel-based) prior to and during surveys, restrictions on night-time/low visibility surveying. IFAW believes that such additional mitigation measures would be a good starting point if the proposed 'OtwaySPAN' survey is to proceed. 3. In terms of blue or sei whales observed foraging within the 3km shutdown zone, the behavioural state of whales observed in this 3km zone is inconsequential. The observed behaviour of whales	• IFAW were advised: • ION has considered IFAW's advice and has applied mitigation measures to meet ALARP • ION is also aware literature in relation to seismic will soon be published, therefore ION has also committed to assessing new literature and will re-assessing potential impacts based on new information, 3 months prior to survey commencement • ION would also like to express that it will not be practical for them to use aerial surveys to spot blue whales at this stage, however this can be considered in the future. • At present, the survey is highly unlikely to go ahead this year. • Summary of mitigations drafted • IFAW will be engaged with ongoing notifications • Conference call can be arranged if required • Assessment of Response from IFAW: 1. Additional blue whale mitigations have been developed to avoid peak feeding season in sensitive	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			is highly subjective, as a whale considered to be 'migrating' could easily be travelling between krill swarms as part of a wider foraging strategy. It is also incredibly challenging for even the most experienced observers to assess whether or not a whale is feeding at such distances. In this respect, the very presence of blue or sei whales should be cause enough to instigate a source shutdown, regardless of whether they are considered to be foraging. 4. Sperm whales: the use of PAM will help to detect the presence of sperm whales and other deep-diving cetaceans. However, it should be noted that the Department's South-west Marine Bioregional Plan states that sperm whales are "known to occur in waters along the shelf break of the eastern Great Australian Bight and waters to the south of Kangaroo Island and are presumed to be foraging in these areas. They are not seasonal: they can be encountered at any time during the year. However, encounters in the feeding areas of the Albany canyons group and the Great Australian Bight appear more frequent in August – September". Therefore, avoidance of the "peak sperm whale feeding period" should be removed from the listed mitigation measures. 5. The above suggestions should not be seen as an endorsement of the proposed activity. Even with the suggested mitigation measures and additional measures above in place, IFAW still believes that the OtwaySPAN seismic survey presents a considerable risk to cetaceans in the area, particularly blue whales, sperm whales and southern right whales. IFAW does not believe that it is appropriate to conduct seismic surveying over such a vast area and over consecutive years, particularly in such sensitive marine environments.	locations, including the Bonney Upwelling and Kangaroo Island canyons. ION will structure the seismic operation schedule to avoid sensitive areas during peak feeding times. ION has been in consultation with experts including Robert McCauley of Curtin University centre for Marine Science and Technology and Dave Paton of Blue planet Marine. ION will continue to use the most up to date information available to ensure key sensitive areas are avoided, where ever possible. ION is aware that there is a tagging study underway and intends on using this data when it becomes public to inform them of sensitive areas. It is acknowledged that the recognised BIA is not the only sensitive area for these endangered species. Due to the broad distribution and temporal patterns of blue whales, it cannot be guaranteed that all blue whale encounters will be avoided. However, ION has implemented mitigation controls ensure that any possible behavioural disturbances are as low as reasonably practicable. November to May is the proposed seismic timing, not to acquire data in these areas would not meet the geophysical objectives of the survey. 2. ION has considered the use of aerial surveys pre commencement and during the survey, however as a result of the nature of a 2D survey, approximately 100 km will be covered a day during operations and it is not considered a viable adaptive management tool to commission an aerial survey to run ahead of the survey acquisition path. Efforts will be made to avoid known blue whale sensitive areas during particularly sensitive times. The vast distances to be covered by the ION survey are not conducive to discrete aerial surveys. Furthermore, fuelling a survey plane ahead of the survey would be cost prohibiting.. Therefore pre-survey planning and the use of MFOs in the direct vicinity of the survey vessel is considered most practical to cetaceans in the survey area. Therefore aerial surveys will not be considered further for this survey. Furthermore, ION has reviewed the Origin Energy 'Astrolabe' survey (EPBC referral 2010/5700) and has considered conditions where appropriate in this EP. 3. As per IFAW advice, 3 km mitigation has been revised to 2 km as per the EPBC Policy statement 2.1, furthermore, other mitigations for survey timing, location, use of MFOs and PAM have been revised. 4. PAM will be used for all whale species in all locations, during daylight, low visibility and night time (24 hours). However it is considered beneficial and will reduce potential impacts to sperm whales to avoid peak feeding periods (August – September), therefore this mitigation will remain.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
				5. ION has considered and will implement additional measures for blue whales, sperm whales and southern right whales. Furthermore, activity timing has been revised to Start Nov – end of May so operation will not occur during southern right whale or humpback whale migration during May [*error in email sent to IFAW – 'operation will not occur' should be 'operation will be limited to'. If queried ION will ensure the sentence is corrected*]	
		01/05/2015	1. IFAW considers aerial surveys are the most practical and effective tool for monitoring blue whales and this survey technique has been used with success in the mitigation of offshore oil and gas exploration activities in this area and on several occasions. 2. Despite IONs response, IFAW also believes that it is still necessary to remove avoidance of the "peak sperm whale feeding period" the listed mitigation measures for the reasons listed in our previous email and that the use of PAM help to detect the presence of sperm whales and other deep-diving cetaceans	1. ION has considered the use of aerial surveys, however as a result of the nature of a 2D survey, approximately 100 km will be covered a day during operations, fuelling a survey plane ahead of the survey would be cost prohibiting, and the blue whale still remaining in the same location by the time the survey vessel reaches that location is highly unlikely. Therefore the use of MFOs and PAM in the direct vicinity of the survey vessel is considered more practical and reduce the potential risk to cetaceans in the survey area. Therefore aerial surveys will not be considered further for this survey. Furthermore, ION has reviewed the Origin Energy 'Astrolabe' survey (EPBC referral 2010/5700) and has considered conditions where appropriate in this EP. 2. PAM will be used for all whale species in all locations, during daylight, low visibility and night time. However it is considered beneficial and will reduce potential impacts to sperm whales to avoid peak feeding periods (August – September), therefore this mitigation will remain.	
		05/05/2015	Despite ION's correspondence, IFAW again wishes reiterate our concerns about the misinterpretation of 'peak' timing for a number of whale species in the proposed seismic survey area: • Sperm whales: the Department of the Environment South-west Marine Bioregional Plan states that sperm whales are "known to occur in waters along the shelf break of the eastern Great Australian Bight and waters to the south of Kangaroo Island and are presumed to be foraging in these areas. They are not seasonal: they can be encountered at any time during the year. However, encounters in the feeding areas of the Albany canyons group and the Great Australian Bight appear more frequent in August – September". Therefore, it is inaccurate to include "peak sperm whale feeding periods (August – September)" in the listed mitigation measures and this should be removed. • Blue whales: it is inaccurate to include "avoid feeding upwelling areas (Bonney Coast upwelling and Kangaroo Island canyons) for blue whales during the peak feeding timing in February" as a mitigation measure for the proposed seismic survey. These upwelling areas are important feeding habitat for blue whales from November to May, as stated in the South west Marine Bioregional Plan. In fact, the Department's Species group report card – cetaceans for the South-west Marine Region states that "The Eastern Great Australian Bight Upwelling/Kangaroo Island	• More frequent and peak are considered interchangeable. Again, PAM will be used for all whale species in all locations, during daylight, low visibility and night time (24 hours) to minimise any impacts to whales in the vicinity. However it is considered beneficial and will reduce potential impacts to sperm whales to avoid acquiring seismic data during the peak feeding periods (August – September), therefore this mitigation will remain. • ION is aware of available literature for blue whales in the survey area, including time periods and peak activity. In order for impacts to reach ALARP and appropriate mitigation measures chosen, ION have been in communications with a key contact working on the tagging study and have been advised of key findings prior to publication, for instance high frequencies of blue whales in feeding habitats during February. ION considers this to be the most up-to-date information. ION would be unable to completely avoid the Bonney Upwelling area as they would not be able to meet the geophysical objectives of the survey, and so considerations have been made towards peak timings and behaviours.	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			canyons are other important foraging habitats for pygmy blue whales between November and May (peaking in December)." • Also, the tagging study referred to by ION has so far seen tagged blue whales remaining in the Bonney Upwelling area for the last 3 months, staying in and consistently traversing the area. This information is available from the scientists working on this study now and ION can utilise this knowledge to avoid the sensitive Bonney Upwelling area, as they suggest in the email below. • Other species: the importance of this area to a diverse range of cetaceans should also be noted, in addition to blue whales, sightings of fin whales, Shepherd's beaked whales, pilot whales, killer whales, Risso's dolphins, common dolphins and bottlenose dolphins are common in the Bonney Upwelling area. A recent publication in the Journal of Wildlife Management highlights the importance of this area in more detail:http://onlinelibrary.wiley.com/doi/10.1002/jwmg.867/abstract	• Thank you for the link. ION has considered cetaceans and presence and possible impacts throughout the survey area in the EP.	
Oil and Gas					
Bight Petroleum Pty Ltd	SA	16/07/2014 – consultation letter sent via email 18/07/2014 – email	ION has been informed that the Bight Petroleum 'Lightning' 3D Seismic Survey within permits EPP 41 and EPP 42 has an EP accepted for a seismic acquisition window between 1 March and 30 May 2015 (or 2016) and requests that ION do not acquire data in the vicinity of the survey during the acquisition window	Feedback considered, however adhering to no acquisition from March – May would leave insufficient time for ION to complete the survey. ION considers a 40 km buffer between both seismic survey vessels is sufficient, both in terms of operational and environmental risks. Shapefiles and survey area shapefiles sent as per email request from IFAW Ingress questionnaire sent, permission to ingress will be used as approval from the stakeholder Control Measure developed: • Survey vessel will not operate within 40 km of other operating seismic survey vessels Ingress email sent from ION on the 6/02/2015;	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
BHP Billiton Petroleum (Victoria) Pty Ltd	VIC	16/07/2014 – consultation letter sent via email	General comments: • Request for shapefiles of sail lines and survey area • Proposed sail lines overlaps BHP Billiton's operated Vic-L22, no issues with the intention of the survey, however it is required that an ingress agreement is in place for our approval Forward forthcoming communications regarding ingress to Mr. Angelo Mustica, BHP Billiton's Petroleum's Commercial Manager	Shape of survey area and sail lines sent to BHP Angelo Mustica will be contacted in regards to the ingress agreement Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Esso Australia Pty Ltd	VIC	16/07/2014 – consultation letter sent via email	Esso Australia take no exception to the proposed activity, however they would like to receive the data acquired over their blocks.	Noted – data will be provided under purchase agreements for multiclient data Ingress questionnaire sent 6/02/2015, permission to ingress	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
		13/08/2014 – email correspondence with Farrah Tan-Savva commences		will be used as approval from the stakeholder	Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
3D Oil	National	16/07/2014 – consultation letter sent via email 07/08/2014 – email correspondence with Chris Pike commences	• Independently request that ION provide additional information and the Survey shape file and ION planned timings for the vicinity of the survey area	Shapefiles of sail lines and survey area sent Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Origin Energy Resources Ltd	National	16/07/2014 – consultation letter sent via email 06/08/2014 - email correspondence with Neil Millar commences	• 3D seismic program in the offshore Otway basin between November 2014 and January 2015 • Cumulative impact of seismic surveys in the region as raised by their fishing stakeholders	Shapefile of proposed survey area requested The proposed survey is unlikely to occur in proximity to the mentioned survey Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Hibiscus Petroleum (Carnarvon Hibiscus (CHPL))	National	20/08/2014 – consultation letter reminder 26/08/2014 - email correspondence with Thomas Stensgaard commences	Feedback: • Carnarvon Hibiscus (CHPL) would like to advise that it has a number of forthcoming activities planned for the VIC/L31 (West Seahorse [WSH]) and VIC/P57 (Sea Lion) areas which should be considered when undertaking any marine seismic survey (MSS) activities in the area so that there is minimal interference between the activities. • CHPL advises of the following activities and indicative timings, however these may vary based upon vessel and rig availability: o Geophysical and Geotechnical Survey (Q4 2014-Q1 2015): CHPL will be undertaking a geophysical and geotechnical survey at the WSH and Sea Lion locations in preparation for drilling and development activities. CHPL can provide further details on the actual areas involved in this survey, however would prefer that MSS activities do not coincide with the survey; o Sea Lion and (possible) West Seahorse Drilling (Q2 2015 – Q4 2015): CHPL will be undertaking exploration drilling at Sea Lion with an expected spud date of April 2015 and drilling program of 25days. A further two WSH Development wells (currently options) may be drilled either immediately after the Sea Lion well or in a later well slot towards the end of 2015. Vertical seismic profiling (VSP) activities are planned as part of the logging activities and CHPL would	Sail lines are not anticipated to enter VIC/L31 Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			prefer that MSS activities not coincide with that specific activity. We attach a Drilling Consultation Information Sheet to provide more details on the proposed drilling activity; o West Seahorse (WSH) Development installation (Q1 2016): CHPL is currently planning to undertake Development installation activities at the WSH location during this period and there will be substantial activity in VIC/L31 at that time. o CHPL would like to be made aware of intended timings for the ION survey within the Gippsland Basin area to ensure that the activities (& relevant sub-elements) do not conflict with each-other. We understand that ION will be seeking an access agreement to acquire any seismic data within VIC/P57 and VIC/L31. This correspondence should be directed to tom@hibiscuspetroleum.com		
Chevron Australia Pty Ltd	National	16/07/2014 – consultation letter sent via email 21/08/2014 – email correspondence with Carole Schaefer commences	General comments: • Chevron does not object to the planned Ion 2D survey along the South Australia margin as long as there is no interference with the Nerites 3D seismic acquisition program in Chevron permits EPP44 and EPP45, and a minimum distance of 50 km will be maintained between the vessels. • TGS will be acquiring the Nerites 3D seismic program between December 2014 and June 2015 within the attached survey outline. • Environmental permits have been approved and the seismic vessels have been contracted, so the Nerites program is confirmed for that time frame. • Please contact Tanya Johnstone (Tanya.Johnstone@tgs.com +61 8 9480 0022) at TGS for further information and coordination if required.	Advised that at this stage the timing and schedule for the proposed survey is still to be confirmed. On finalisation of the survey programme ION will review the schedule and should any spatial or temporal overlap with the Nerites survey be anticipated, ION will contact Tanya directly to ensure interference is prevented. Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder Control measure developed: • Survey vessel will not operate within 50 km of other seismic survey vessels acquiring in the Nerites survey area	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Santos	National	16/07/2014 – consultation letter sent via email 20/08/2014 – consultation letter reminder 09/09/2014 – email correspondence from Samantha Jarvis	Advised that for any stakeholder consultation for Santos offshore petroleum activities contact Tom Baddeley.	Noted	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
		14/11/2014 – revised notification	Samantha Jarvis, Santos, has the following questions in regards to the survey in relation to activities we are involved in within the Great Australian Bight and offshore Victoria. As we have similar stakeholders in these areas it would be good to be able to further understand potential noise levels and your stakeholder engagement plans. 1. Please note that Appendix 2 was not attached with the email. 2. Could you confirm that the planned start date is the end of December 2014?	1. Provided original stakeholder letter which includes the full stakeholder list. 2. Taking into account potential vessel contracting constraints and the time taken to gain the necessary environmental approvals, the end of December is the earliest date the survey could commence. Ideally the survey will commence by the end of December, but this may be delayed should vessel availability or EP approval necessitate. 3. It is currently intended that all sail lines will be	

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			3. Which lines are proposed to be survey in the 2014/2015 season? 4. Could you clarify the 110 days. Is this the total days of the survey or the total days the survey will be undertaken each year between Nov to June? 5. What will be the sound exposure level of the seismic source and at what distance is it estimated that the sound from the seismic source will attenuate to background levels? 6. When will the EP be submitted to NOPSEMA? 7. If the survey is planned to commence in Dec 2014 are you planning to meet with any stakeholders? If so which ones?	acquired in the one season. The EP is written to allow operations to occur across three years in the event that logistical constraints prevent completion in the one season. 4. This is the total duration of the survey, all sail line are expected to be acquired in 110 days. 5. Given the large area over which the survey occurs, using ambient noise levels is not really appropriate given that ambient will differ between locations due to physical conditions (e.g. wind speed, water depth), biological factors (e.g. cetacean vocalisations, fish choruses) and other anthropogenic activities (e.g. high levels of commercial shipping). We will be using noise modelling conducted for a previous seismic survey conducted by ION in Australian waters with the same intended source volume to inform impact discussion to sensitive receptors. Where available, thresholds for impacts to sensitive receptors will be considered and the expected distances from the seismic source to these thresholds estimated from the modelling, rather than discussing a generic distance to ambient. 6. Imminently, within the next 2 weeks. 7. The initial consultation with stakeholder provided an invitation for face to face meetings; meetings with those which were interested were carried out in October – stakeholders listed	
		12/12/2014	Requested to be kept up to date about start of survey.	Ion responded that they will keep Santos up to date with survey developments. Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	
Roc Oil Company	National	20/08/2014 – consultation letter reminder 21/08/2014 - email correspondence with Sue Davie commences	Roc Oil advises that ROC no longer has licenses in the survey area, having recently sold the BMG asset to Cooper Energy (copied on the email)	Noted. Notification update sent to Cooper Energy Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Cooper Energy	National	4/05/2015 email	Requested maps and proposed schedule	Maps sent and advised that proposed schedule is not yet determined Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
					etc. (3 months prior to survey commencement, and each phase)
Trident Energy	National	20/08/2014 – consultation letter reminder 28/08/2014 – email correspondence with Chris Haslam	Advised that Trident Energy are currently progressing a takeover offer, and consultation email was put aside temporarily, now has been forwarded to MD for prompt attention.	No further response received from stakeholder Ingress questionnaire sent 6/02/2015, permission to ingress will be used as approval from the stakeholder	Ingress agreements will be signed by listed operator prior to seismic vessel entering permit area Ongoing stakeholder notifications to be issued for commencement of start date and other notifications of applicable survey logistics, such as website and FLO etc. (3 months prior to survey commencement, and each phase)
Shipping					
Australian Marine Safety Authority (AMSA)	National	15/07/2014 – consultation letter sent via email 18/07/2014 – email correspondence with Meredith Clark commences	General comments: • Shapefile requested • Ensure that the operator of the survey vessel keeps the Rescue Coordination Centre (RCC) rccaus@amsa.gov.au of AMSA advised of its movements • SITREPs will be required to be sent to AMSA's Rescue Coordination Centre (RCC) at the start and completion of works • The information passed to RCC should contain dates of the survey, the name of the survey vessel, name of guard/support vessel, array dimensions, clearance distance requested and centreline coordinates of the runline • ION will need to advise the Australian Hydrographic Service through hydro.ntm@defence.gov.au for their Notices to Mariners (NtM) promulgation well in advance of the commencement of operations (at least 2 weeks prior). • ION to provide information on the name of the vessel conducting the survey and supporting vessels • Chartlet provided of displaying vessel shipping traffic (January-April, 2014) in the area of operations to be provided to the Vessel Master, other risks to consider: o Large volumes of concentrated shipping traffic will be encountered within the survey area including risks from exploration activities o Between Cape Otway and south of Port Phillip Bay there are 5 established converging shipping routes which lead to and from Bass Strait and major southern ports o South and East of Wilson's Promontory there is an established International Maritime Organization (IMO) approved Traffic Separation Scheme o Offshore Gippsland houses a large Area to be Avoided (ATBA) and another Traffic Separation Scheme o Commercial and local traffic follows the East Coast of Australia o Commercial and local traffic follows the Victorian and South	Requested shapefile sent to AMSA Commitments in EP amended accordingly, i.e. reporting arrangements Areas to avoid and high vessel risks noted and Vessel Master notified accordingly	ION will provide requested information and survey updated prior to survey commencement Ongoing stakeholder notifications, including relevant marine notifications, to be issued for commencement of start date and other notifications of applicable survey logistics.

Stakeholder	State	Consultation Method	Stakeholder Response	ION Assessment of Claims / Action Taken	Status / Action Required
			Australian coast o Commercial and local traffic follows the Tasmania coast o Commercial and local traffic travel to/from Melbourne, to/from Perth o Commercial and local traffic travel to/from Port Lincoln and/or Adelaide, to/from Perth • Many Commonwealth Marine Reserves also overlap the proposed survey area • At the conclusion of the survey, AMSA request that ION be in touch to comment on the operations and the interaction with commercial shipping during the time of the survey (i.e. any lessons learned)		
		05/05/2015 – Survey update notification sent	Comments in AMSA's correspondence on this survey in July 2014 still stand. Also attached is an updated vessel traffic plot of the area of interest for your records.	Correspondence reviewed – as previous. Vessel plots reviewed, noted in EP commercial shipping is prevalent throughout the region thus relevant notifications needed	

9 CONTACT DETAILS

Further information about the survey can be obtained from:

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