EXECUTIVE SUMMARY:

Introduction: Oryx Petroleum Corporation Limited has commissioned Envoi to identify a strategic partner to join them in the exploration and appraisal of their large AGC Shallow Block situated offshore, NW Africa, in a maritime zone that straddles the border between Senegal and Guinea Bissau, in which oil and gas activities are regulated and managed by the AGC (Agence de Gestion et de Cooperation avec Sénégal et Guinea Bissau). This zone includes the 1,700 km² AGC Shallow PSC, so-called because of water depths ranging from shore to only 100 metres. Oryx Petroleum operates the PSC with 85% interest through their wholly-owned BVI subsidiary, OP AGC Shallow Limited. Entreprise AGC S.A., the representing company of the joint authority of Senegal and Guinea Bissau, holds the remaining 15% interest in the PSC.

Several exploration wells were drilled in the AGC Shallow Licence area in the 1960s and 1970s which targeted the tops of certain salt domes in the Casamance salt basin and resulted in the discovery of large heavy oil accumulations in Tertiary-aged (Oligocene) carbonates. Significantly, light oil (~33° API) was also encountered in the deeper objectives including the Cretaceous Maastrichtian sandstones. Following award of the Shallow PSC in October 2011 for an initial four year exploration period, Oryx Petroleum acquired 886 km² of modern 3D seismic data in 2012. This was focused over the main salt diapir-related fields and prospects that had been previously defined by legacy 2D seismic data. Oryx Petroleum has focused most of its new technical work on this deeper Cretaceous, in particular the Maastrichtian, where potentially large traps have been mapped on the flanks and, in the case of the primary Iris prospect, over the crest of the salt diapir.

Oryx Petroleum would now like to find a partner interested in earning up to a 40% equity in their Shallow PSC in return for a contribution to Oryx Petroleum’s past costs, including the 3D (est. US$ 30 million gross) and funding all, or a portion, of the two shallow wells planned for Q2 2015 (est. US$ 40 million gross). These wells will test both the highly prospective Maastrichtian light oil potential of the primary Dome Iris prospect and provide a modern appraisal of the Dome Géa heavy oil discovery, originally made by Total in the 1970s. Oil samples, extracted from cores obtained during the drilling of the discovery wells over 30 years ago, provide the only available test of the oil viscosity, raising doubts on sample integrity and, therefore, the accuracy of the data. Technology has now advanced sufficiently that even highly viscous 9° - 11° API oil can be developed commercially for volumes even smaller than the (P50) 1,545 MMSTB of oil in place estimated in Dome Géa and Dome Flore fields, as evidenced by the successful development of heavy oil analogues elsewhere in the world.

Oryx Petroleum’s commitment to the region is highlighted by the announcement in October 2014 that they had also now been awarded the large contiguous AGC Central PSC area immediately west and south west of their Shallow Block. Oryx Petroleum’s interest and work to date on this deeper water acreage, which includes the ‘shelf edge’ play fairway that has recently proven successful to the north in Senegal, confirms its potential prospectivity. Although Oryx Petroleum has only just been awarded this Central PSC, they are willing to consider early involvement of a company which successfully farms in to their Shallow PSC.

Regional Exploration History: Compared with the prolific basins around the coast in Central West Africa, and even along the transform margin, historical exploration offshore NW Africa has been very modest, with most wells having been drilled in relatively shallow water on the shelf where rigs could operate at the time. To qualify this, only around 156 exploration wells have ever been drilled in the whole of Senegal, including just 45 offshore. This equates to an average of about one well for every 1,600 km² with most being only shallow. Interestingly, the very large 1.5+ Billion in-place resource defined in the Dome Flore and Dome Géa heavy oil accumulations discovered in the late 60s (and contained in what is now Oryx’s Shallow acreage) has already proved the region’s large hydrocarbon potential, albeit these accumulations are only around 300+ metres deep and biodegraded as a result. Most other historical wells drilled in the vicinity on the shelf were located to target
structural closures associated with the tops of the various salt domes defined by the old 2D data.

The only other discovery in the immediate region is the Sinapa accumulation to the south, drilled by Premier in 2002 offshore Guinea Bissau, which is reported to have encountered an uncommercial oil accumulation in poor quality Albian sands.

Very few wells have been drilled in deeper water to date, although the FAN-1 and SNE-1 frontier wells, drilled in 2014, were declared by Cairn Energy (October 2014) and its joint venture partners (ConocoPhillips and FAR) to have discovered potentially very large Cretaceous reserves in both shelf break and shelf margin plays to the north of Oryx Petroleum’s acreage offshore Senegal (ref: location map on the previous page). These discoveries are likely to generate significant new interest along the entire 800 km play fairway from Senegal to Guinea-Bissau as they have proven the existence of a previously untested, but now potentially prolific, petroleum system. In particular, they confirm the presence and maturity of the Turonian age source rock that was previously considered the main risk to the play fairway. Historical wells in and around the Oryx Petroleum Shallow acreage back on the shelf had previously encountered the Turonian and Cenomanian source rocks, recording mature sequences with TOCs from 5% to over 8 % below around 2,500 m depth.

The Kora-1 well, drilled by Ophir in 2011, is the only other recent deep water well which has been drilled out on the shelf break. This well targeted the primary Albian and secondary Coniacian and Barremian reservoir intervals which had been highly ranked due to positive Controlled Source Electro Magnetic (CSEM) survey results. Although the key targets were penetrated close to their estimated depths, the rocks encountered were predominantly claystone with a thinly bedded limestone sequence rather than the sandstone reservoir facies inferred from the CSEM survey. The strong electromagnetic anomaly identified is, therefore, now thought to have been caused by the specific combination of rocks producing an unusually high resistivity. The lack of success in Kora-1 clearly dampened some enthusiasm for deeper water exploration at the time and until the Cairn discoveries to the north.

Historically, Elf and Chevron acquired seismic in the shallow coastal region to the east of the proven AGC area between 1979 and 1981, but they never drilled. PetroCanada also acquired several thousand kms of new 2D seismic data in the area between 1981 and 1983, including 70km of infill data over the Dome Flore structure. This resulted in the SenCan-011 well which was spudded in 1983 to appraise the western flank of the Dome Géa accumulation, but the well was never completed due to a dispute at the time between Senegal and Guinea Bissau about their territorial boundary. As a result, the well never reached its Albian target.

AGC Area History: The AGC area was first explored in 1958, when COPETAO (Compagnie des Petroles Total Afrique de l’Ouest) and Exxon were awarded licences in Senegal and Guinea-Bissau respectively. Structural traps related to the salt diapirs were targeted with old 2D seismic acquired by CGG. Subsequent drilling resulted in the initial discovery of the Dome Flore heavy oil accumulation in 1967 with the CM-5 (and updip sidetrack), CM-6 and CM-7 wells drilled in around 50 metres of water, which all encountered biodegraded oil in variable but locally excellent quality unconsolidated Oligocene foraminiferal limestones between 300 and 400 metres deep. The Total & Texas Gulf consortium later drilled some 7 wells in 1970, resulting in discovery of the Dome Géa accumulation by the CM-9 well. Six subsequent wells were drilled to appraise both discoveries. These included the DG-1, 2 and 3 wells, drilled to define the Dome Géa closure, and the SF-4, DF-5, DF-6 and DF7 wells to further appraise the Dome Flore closure. These wells all confirmed the presence of potentially very large quantities of heavy oil in Oligocene carbonates, which locally comprised excellent quality foraminiferite reservoir facies in the Dome Flore, although the low gravity of the accumulation was deemed uncommercial at that time.
Both heavy oil discoveries, therefore, remained unevaluated until the early 1990s when the first 3D seismic was acquired in 1992 by Casamance Petroleum, with a 304 km² reconnaissance survey over Dome Flore and Dome Géa fields. PECTEN farmed-in to the block and assumed operatorship in 1995 in return for funding the outstanding exploration well obligation. The resulting shallow Baobab-1 well, drilled in 1996, confirmed heavy oil in the Oligocene on the eastern flank of Dome Géa closure but, significantly, it encountered light oil shows in the Paleocene and deeper Maastrichtian (which log analysis shows has porosities up to 36%). The extended period of very low commodity prices at the time, however, is thought to have prevented consideration of further commercial development evaluation.

In contrast to all the previous exploration, Oryx Petroleum has focused an equal proportion of its technical work on the deeper Cretaceous, over the top and around the flanks of the salt diapirs, in which only light oil (30 to 35° API) has been encountered by several of the historical wells. This clearly indicates that the oil biodegradation is restricted to the shallower Tertiary play. This is further supported by the historical SF-4 well, drilled in 1996, confirmed heavy oil in the Oligocene on the eastern flank of Dome Géa closure but, significantly, it encountered light oil shows in the Paleocene and deeper Maastrichtian (which log analysis shows has porosities up to 36%). The extended period of very low commodity prices at the time, however, is thought to have prevented consideration of further commercial development evaluation.

In addition to the light oil shows observed in the Baobab-1 well and produced from the SF-4 well, the CM-6 encountered an 18m section of Maastrichtian sands with shows. The CM-7 well, however, found light oil in the deeper, albeit very low porosity, Albian. This well suggested the Albian was a potential target at the time although Oryx Petroleum’s work, including extrapolation and interpretation of the available data, together with regional palaeo-depositional history models, now clearly indicates that the Albian sands are much less well developed in the AGC Shallow acreage, and were deposited further back on the shelf, than it is to the south, offshore Guinea-Bissau. Here, as evidenced in Premier Oil’s Sinapa-2 and side tracked discovery well, a more distal facies appears to have been deposited. Although the play fairway is not dissimilar to the play that Oryx Petroleum is pursuing further north, the primary reservoir in AGC Shallow is the Maastrichtian reservoir sands proven by the existing wells.

**Oryx Petroleum’s AGC History:** Oryx Petroleum’s new 3D has much improved their ability to accurately map both the Tertiary and Cretaceous plays. In particular, the new data has resolved issues with conventional 2D surveys which suffered from ringing multiples generated in the shallow section, making mapping the highly dipping salt diapir flanks very challenging. To remedy this the 886 km² modern 3D seismic data, acquired in 2012 by Fugro and processed by PGS using PSTM and PSDM, has allowed far more accurate mapping, particularly of the Cretaceous, and enabled a refined salt model to be developed.

Most recently, in October 2014, the newly defined 3,150 km² **AGC Central Block**, created out of part of Ophir’s old block relinquished in 2014, was awarded to Oryx Petroleum. This now adjoins their Shallow PSC, creating a significant area under Oryx Petroleum’s operatorship of some 4,850 km² with water depth ranging from ranging from 10 – 1,500 metres.

**Summary of Regional Geology & Stratigraphic Evolution:** As the regional location map on the first page shows, the AGC area lies within the Mauritania-Senegal-Guinea-Bissau Basin (‘MSGB’). This consists of a linear group of only modestly explored West African passive continental margin, largely Mesozoic, sub-basins running parallel to, and locally overlapping, the West African coastline. These developed as the Atlantic Ocean opened.

The Casamance sub-basin in which Oryx Petroleum’s AGC Shallow acreage sits is located within the MSGB fairway and has undergone a complex history that can be divided into three main phases of evolution:

1 - ‘Pre-rift’ (Upper Proterozoic to Palaeozoic): The Pre-rift stratigraphy has not been penetrated by any of the existing offshore wells although onshore outcrops and wells, together with the offshore seismic, confirm the stratigraphy consists mainly of Precambrian to Devonian rocks. These now form the basement to the early rifting as Gondwanaland started to split, which subsequently led to the opening of the Atlantic. The Pre-Rift stratigraphy outcrops in the Bove Basin onshore southern Senegal and Guinea, where they are predicted to be as much as
3,500 m thick. This compares with over 5,000 m of pre-Mesozoic rocks interpreted from seismic data in the deeper offshore part of the Senegal basin.

The pre-rift section is also recognised onshore in the southern part of Casamance sub-basin where the Diana-Malari (DM–1) and Kolda (KO–1) wells penetrated Ordovician, Silurian, and Devonian. Here, an extensional system is defined in which a pre-Hercynian structural style of horsts and grabens and tilted blocks is preserved today. This contrasts with the compressional regime defined in the central and northern parts of the Senegal basin resulting from the combined effect of Caledonian and Hercynian orogenies.

II - ‘Syn-rift’ (Permian to Triassic): Late Triassic to Early Jurassic rifting began as America and Africa began to pull away from each other, with syn-rift continental sediments deposited in the developing basin. Rifting continued in the Early Jurassic with the creation of new crust from the developing Atlantic spreading ridge. This proto-oceanic stage is characterised by a thick evaporite sequence and widespread anoxic deposits. As a result, the syn-rift section consists principally of thick evaporites overlying Triassic clastic rocks which were deposited as early rifting occurred and local continental erosion into the rift was accompanied by shallow mineral rich lakes. In the AGC region, the evaporite section may be as much as 2,000 m thick, mostly salt, with an anhydrite cap. This evaporite section has undergone extensive halokinesis, evidenced by salt diapirs intruding the overlying Post Rift Cretaceous and Tertiary rocks.

A period of relative tectonic inactivity followed the Cenomanian, with deposition of deep marine shales in anoxic conditions. These Cenomanian-Turonian bituminous shales are the main oil source rocks for the Licence, with proven regional oil potential. Secondary source rocks may include Triassic shales and intraformational shales and coals within the Albian-Aptian limestones. Uplift and exposure of the carbonate platform in a tropical climate and associated karstification at the Senonian unconformity was concurrent with channel erosion and incision. These incised channels transported reworked carbonates and siliciclastics down the slope, depositing them in fans which, through repetitive influxes, are often stacked. The geometries of these fans are similar in form to slope fans along the coast, as far away as Ghana.

The thick sequences of post-Senonian shales are expected to form a good regional seal for the Early Cretaceous Albian and Aptian platform carbonate reservoirs and were laid down from the Late Cretaceous to the Oligocene across both shelf and slope. In the deep water areas, these sealing shales were subsequently overlain by an additional thick shale sequence deposited from the Oligocene to the present.
The Casamance sub-basin extends south from the Gambia River through the Casamance region into Guinea Bissau where salt diapirs have pierced the Mesozoic section, characterised by a high degree of salt movement (halokinesis). More than twenty salt domes have been identified across this area. This has created the prominent structural closures that have been targeted by historical exploration. In the basin, the heavy oil proven in the Dome Flore and Géa fields is trapped in very shallow Oligocene reservoirs associated with salt diapirs.

**Key AGC Play Elements:** The key play elements in the Shallow AGC play area are defined by the existing wells and seismic. This highlights the development potential of the very large heavy oil accumulations in the Tertiary's Oligocene carbonates and also new primary exploration potential light oil in the deeper Cretaceous, Maastrichtian age sandstones. These can be summarised:

**Reservoir:** Existing wells have proven the Tertiary's shallow Oligocene carbonates as the main reservoir in the Dome Flore and Dome Géa heavy oil accumulations. This has been penetrated by most of the wells drilled over the crest of the Dome Flore and Dome Géa closures but was shallowest in the SF-4 at only 182 mSS over the Dome Flore diapir. The deepest penetration of the Oligocene pay is in the SM-10 well on the flanks of the Dome Géa diapir, where it was penetrated at 716 mSS. The reservoir comprises a so-called ‘foraminiferite’ consisting of an accumulation of unconsolidated planktonic foraminifera which is largely un-cemented to partially cemented by sparite and clay containing phosphate. The unit ranges in thickness from around 2m over the crest of the Dome Flore closure to 87mSS where encountered in the SenCan-011 well. Samples from a mini core from the CM-5 well indicate that excellent porosities range between 40 - 60% with an average above 50%!

Secondary reservoirs in the Tertiary include the even shallower Miocene which contains variable fine-to-medium grained marine sandstone reservoir potential with good porosities up to 45% where penetrated, but is considered too shallow, with only heavy oil shows where encountered to date. Also, in the early Eocene, the F-6 well encountered a friable partially cemented carbonate build-up with potentially excellent reservoir potential but this is expected to be only developed locally. Locally fractured Palaeocene dolomites were also encountered in the SF-4 well, though it is thought possible that some of the oil recovered on testing from the Maastrichtian may have come from this horizon too.

In the **Cretaceous**, the Maastrichtian sands are considered the primary target in Oryx Petroleum’s acreage and which are interpreted to be best developed around the flanks and potentially over the Iris salt Dome. Although various wells have encountered Maastrichtian sands, significantly the SF-4 well (mentioned above), drilled in 1970, penetrated a 12 metre gross interval of good quality Maastrichtian sands between 674-686 metres deep which contained a net 7 metres of reservoir. This is reported to have produced 13 barrels of light 33° API oil in just a one hour flow test, which is equivalent to ~312 bopd.

The Maastrichtian sands do vary in thickness over the area as evidenced by its absence in some wells, due to erosion related to salt movement. Over 150+ metres of Maastrichtian was encountered in the CM-10 well, drilled in 1970 immediately south west of what is now Oryx Petroleum’s Shallow Block. This supports the interpretation that the Maastrichtian is a prograding outer shelf / upper slope sequence that thickens westward into the basin as the sea regressed. As the SF-4 and F-7 wells confirm, the sands are found over crestal parts of the diapirs but are best developed in the flank wells including the Baobab-1, G-2 and SenCan-11 wells, with porosities up to 35%.

As the regional distribution maps below show, the Maastrichtian is interpreted to be better developed in the AGC area than the Albian, which is developed further to the south. Based on extrapolation of the available data, the reservoir in Oryx Petroleum’s Iris Dome prospect is expected to exhibit porosity in excess of 25% (as already confirmed by the Baobab-1 log analysis) with at least 200 mD instead of ~10% and ~5 to 10 mD in Albian in Sinapa discovery and permeability instead thought to exist in Sinapa.

The CM-2 and CM-7 wells drilled within, and adjacent to, Oryx Petroleum’s Shallow Block also encountered good inboard Maastrichtian sequences. It confirms (along with 10 other wells on the license) the presence of very good Maastrichtian reservoir, with an average N/G of 75% and average porosity of 28% in the area.
The Albian, which is the primary reservoir in the Sinapa field to the south, offshore Guinea Bissau where it is best developed as the distribution maps indicate, is present in the AGC shallow area, but shaley with only minor reservoir potential where encountered by the CM-10 and CM-7 wells, so is now considered as a secondary objective in Oryx Petroleum’s AGC Shallow Licence area.

**Source:** The most effective Cretaceous source rocks related to hydrocarbon discoveries and production in the Senegal Basin and AGC region are the Cenomanian-Turonian marine shale units developed in the Casamance sub-basin, where the richest source rocks contain Type II organic matter surrounded by a large area containing Type III organic material. These source rocks are reported to be between 330 to 490 m thick and exhibit source potential ranging between 5 and 75 kg/ton. The Turonian interval contains bituminous shales that were probably deposited under anoxic conditions up to 150 m thick. Samples analysed from the CM-10 and CM-7 wells contained Turonian Type II kerogen over a 120+ metre interval of with TOCs ranging from ~7% to more than 10%, but which average over 5% and a HI (hydrocarbon index) of 638 mg/g. Modelling suggests that this would have been mature from early Tertiary times with a contribution from the underlying Cenomanian which has similar source characteristics and remains mature present day in the vicinity of Dome Flore and Dome Géa.

The zone of oil generation in parts of the Casamance sub-basin is also relatively shallow, due to a higher geothermal gradients related to salt diapirism with the average geothermal gradient around 30 °C/km. The top of the oil window, therefore, ranges from 2,285 to 2,680 m in the area as a result. This compares to 2,800 m in the PGO–3 well to the south, where Cenomanian source rocks are immature. Migration of hydrocarbons most likely began in the late Miocene and continues to the present day.

Other more minor source rocks within the post-rift section have also been identified including the Albian, which was penetrated in the CM-7 well containing bituminous shales adjacent to the sands that contained shows. The Senonian and Maastrichtian (2–5 kg/ton, Type II and III), the Paleogene (greater than 5 kg/ton, Type II with detrital Type IV) and the Miocene to Pliocene (2–5 kg/ton, Type II) also all have source potential.

Geochemical data obtained from Deep Sea Drilling Project well samples (DSDP 367 and 368) identified potential Neocomian to Cenomanian source rocks, even beyond the 2-second sediment isopach. This confirmed that source rocks in ultra-deepwater contained mostly Type II kerogen with TOC values ranging from ~3% to 10+%

The graptolitic Silurian Buba shales up to 400 m thick in the southern half of the Senegal Basin, equivalent to the oil-rich Silurian Tanezzuft Formation of North Africa, where encountered in the Diana-Malari (DM–1) and
Kolda (KO–1) wells onshore. Together with outcrop studies in the Bove Basin and the Guinea Palaeozoic Basin, show the Silurian shales contain black amorphous organic matter and have TOCs ranging from 1 to 5.5 percent. Burial history profiles and maturation studies determined from geothermal gradient data and samples analysed from wells that penetrated the Mesozoic and Palaeozoic units indicate that these Silurian rocks have undergone two periods of oil generation beginning in the Carboniferous (300 Ma) which continued into the Hercynian orogeny (about 250 Ma). Generation paused during the Peronian and Triassic, resumed during the Cretaceous and continues to the present. The zone of oil generation ranges in depth from 1,850 to 4,000 m in the southern part of basin. These potential source rocks are also likely to extend offshore beneath the rapidly thickening syn- and post-rift stratigraphy where they could also be mature.

Source rocks may also be locally mature in the syn-rift, including the Upper Permian-Lower Triassic lacustrine rocks that underlie the thick Triassic salt unit. Seismic studies have delineated this clastic section in the Casamance region of southern Senegal although never penetrated by drilling in the area. Analogues in Morocco and the Newark Basin of North America confirm that similar rift basins contain such lacustrine beds with Type I and Type II organic matter ranging from more than 2% to 35% TOC, although they are commonly variable in organic content and thickness. A similar, but younger, syn-rift section related to the opening of the South Atlantic is evidenced along the west-central African coast in the Congo-Cabinda basin, off the coast of Congo. Here, the section consists of Neocomian to Barremian lacustrine rocks of the Melania Formation overlain by Aptian evaporite rocks of the Loeme Formation in which lacustrine rocks contain both Type I and Type II organic matter averaging 6.1 percent and reaching as high as 20 percent.

Prospectivity: Oryx Petroleum’s recent 3D seismic and PSDM processing has provided much greater detail and enabled a far more accurate interpretation of the salt structuring and associated sediment boundaries. The resulting interpretation highlights the new prospects and leads in the Cretaceous with a primary Maastrichtian play target associated with the undrilled Dome Iris salt diapir, along with appraisal / development potential of the Dome Géa and Dome Flore heavy oil accumulations in the Oligocene carbonates above their respective diapirs (See structure map above).
Exploration Potential: Three light oil prospects have so far been identified within deeper Maastrichtian to Albian targets on the flanks of the Dome Iris salt diapir. Combined, these closures contain an estimated combined PMean STOOIP of 638 MMbbls and 194 MMbbl of P50 unrisked gross prospective recoverable oil resources. The primary exploration target is the Maastrichtian closure, defined by the new 3D on the flank and over the crest of the Iris diapir. This will to be the target for the first of the two wells being planned for mid-2015 and alone has an estimated in-place resource potential up to 475 MMbbls STOOIP with a prospective resource of 96 MMbo recoverable.

The deeper Albian reservoir, which is mapped as a deeper salt flank closure in the Iris prospect, was originally a drilling target, but subsequent seismic interpretation and regional stratigraphic facies evaluation has confirmed that the reservoir presence, quality risk, and the cost of deepening the well for the resource potential to be tested, are simply too high risk.

Appraisal / Development Potential: If light oil is discovered in the Dome Iris Maastrichtian reservoir target, the very favourable PSC terms, plus its location in shallow water, relatively close to the coast, will enable various development scenarios so that, even with lower oil prices and modest reserves, a development would be commercial (see est. value potential over the page).

More complex are the heavy oil accumulations which have been the target of several unsuccessful appraisal programmes over the last 20+ years. Dome Géa is the larger of the two and, with an estimated P50 STOOIP of 934 Billion bbls, is the target for the planned Acacia-1 appraisal well. This is partly because of the thicker 60m oil column with the best developed Oligocene foraminiferite reservoir facies and compares with the 30m interval found in the Dome Flore closure.

Even though the oil in the Dome Flore and Dome Géa fields has a low estimated 9-11° API gravity and very high 3500cP viscosity (measured in cores 30 years ago from the CM-5 well), due to the highly unconsolidated nature of the foraminiferite Oligocene reservoir and the locally very high porosities, it is believed that these fields may be capable of being produced by way of a CHOPS (Cold Heavy Oil Production with Sand) development. This has successfully been pioneered in very heavy oil fields elsewhere in the world, including Canada and Venezuela, offshore Brazil and also the North Sea.

The CHOPS development technique includes drilling 1,400+ metre-long horizontal wells in real time on 3D seismic to maximise the penetration in the best reservoir facies. Diluent injections, consisting of polymer-viscousified water, are injected into the bottom of the wells to significantly decrease head loss along the wellbore and accelerate recovery by increasing the piston effect of the sweep. The use of progressive cavity pumps ensures better control during the start-up of the wells, along with the use of multi-phase pumps (MPPs) to stimulate the flow of crude at the wellhead. This not only ensures savings on surface equipment, but enables more control with the variations in the flow rate as the temperature and pressure of the production over the life of the field changes. Innovative monitoring has also been developed to optimise production management over the long term and help to control water ingress. Sand production is also encouraged as a way to clean the near-wellbore area from asphatenes and/or fines build-up, which in turn enhances permeability channels.

In the Dome Flore and Dome Géa accumulations such a development project can only be confirmed as possible, and a detailed design prepared, after moveable oil from the reservoir and oil quality are fully ascertained by a new shallow well some 30+ years after the last analysis of the oil was carried out. This new well is being designed to have a 30 m core taken across the Oligocene reservoir and a mini-flow test done with a PCP to recover a couple of clean barrels of crude oil to surface. These data are crucial to calibrate well productivity, spacing and the facilities required.
**Data availability:** Although Oryx Petroleum has access to some 250 km of the vintage 2D seismic data in and around their Shallow acreage, the 3D surveys have been instrumental in properly understanding the exploration and development resource potential of the fields and prospects in their Shallow block.

PGS acquired two 3D surveys in 2002, including the 2,587 km² Cheval Marin and the 1,466 km² Croix du Sud surveys, over what is now the Central and Profond licence but at the time was part of a bigger single licence before being split.

Since the licence division, a significant proportion of the Croix du Sud 3D is across the southern part of the Central PSC. Polarcus and GeoPartners have exclusive brokerage rights from the AGC for both of these 3D surveys.

In 2012, an 886 km² modern 3D seismic data was acquired by Fugro across the Shallow PSC and processed by PGS using PSTM and PSDM. This enabled Oryx Petroleum to more accurately define the salt structures in its Shallow PSC acreage.

Polarcus acquired the 1,017 km² Casamance 3D in 2013 in what was the larger AGC Area licence. Since the licence division, this survey now straddles the Central and Profond PSC boundary, with several hundred km² wholly within Oryx Petroleum’s Central PSC. Polarcus data only covers a part of the AGC Central carbonate edge play and Oryx Petroleum is currently evaluating recently acquired 270km of 2D seismic lines on the Eastern part of the block whilst assessing the possibility of performing it’s one seismic acquisition, which would better address the play extension.

Much of the geological and geophysical data acquired in the AGC over the last fifty years is available from the AGC’s Petroleum Data Bank, including well logs, seismic sections, cuttings and core samples. BEICIP has also been commissioned by Oryx Petroleum to prepare a basin study with thermal and HC migration modelling, with the results available in the data room.

**Central Block Potential:** Preliminary analysis by Polarcus of its Casamance 3D seismic on the western side of the AGC Central PSC has shown there is evidence of at least one large structure and potential direct hydrocarbon indicators (DHIs) in several turbidite fan facies or stratigraphic traps. Furthermore, preliminary interpretation of the recently acquired 2D seismic across AGC Central is ongoing. Based on this preliminary work, there are identified structures which might share the same play elements as have been recently proved by the Cairn SNE-1 discovery.

**Market & Infrastructure:** The only hydrocarbon production currently in Senegal is from the Gadiaga Field, discovered in 1997 and now operated by Fortesa, some 60 km northeast of Dakar. This has produced a total of about 3.3 Bcfg to date which produces ~2.5 MMcf gas day, so sufficient to generate around 12 MW of power but nowhere near enough electricity to satisfy anything but a local market as there is little existing infrastructure.

As a result, Senegal imports around 27,000 bopd to cater for a growing domestic demand for all forms of energy with the rest of its electricity generation almost entirely dependent on fossil fuels.

The deep-water port of Dakar is a major transport and logistical hub for West Africa, in close proximity to Dakar’s international airport. It carries much of the regional shipping trade and has the capacity to handle oil and gas support activities.

**Commercial Overview & Value Potential:** Under the favourable PSC terms (which conform to the Petroleum Law of the Republic of Senegal enacted in 1998) the AGC Shallow Licence is held by Oryx Petroleum, the government take is around 50% with full cost recovery, such that scoping economics show a commercial development is possible with as little as 15-20 MMbbls oil recoverable.

The representing company of the joint authority of Senegal and Guinea Bissau, which has a 15% interest in the PSC, is carried through exploration by the remaining
interested parties, with the right to back-in for an additional 5% paying interest upon declaration of commerciality.

Even at US$ 40/bbl, the economics for a discovery of just the (P50) 96 MMbbls recoverable in the Maastrichtian sand target at the Iris Dome prospect could be expected to generate a contractor NPV@10% up to US$ 300+ million based on a development of 14 producers and 5 injector wells. This equates to a project IRR in excess of 60%. The threshold resource at this oil price is still only 15 MMbo recoverable.

Even though scoping economics of a heavy oil development is far more difficult due to the large number of variables and uncertainties, should the planned appraisal at the Acacia-1 well location prove that the oil in the Dome Géa field is moveable, even 10% recovery of the very large volume of oil in place would be expected to represent significant recoverable volumes and reserves/resource addition, with the outlook of generating good revenues over a long period of time in several years when crude prices are back at higher levels (NPV@10% >US$ 240+ million and IRR over 25% with crude prices at 80$/bbl).

**Obligations & Work Programme:** Oryx Petroleum will drill two-wells in its AGC Shallow PSC in mid-2015, irrespective of finding a new partner. This, along with the new 3D acquired in 2012 as part of the PSC obligations, will fulfil its commitments for the 1st Exploration (4yr) Term that expires in October 2015. The original PSC obligation required a new 3D seismic survey, which has been fulfilled, and one well, to be drilled to 2,000 metres TVD. The plan is to drill two shallower wells to test both the primary new Dome Iris Prospect plus a modern appraisal and possible flow test and development of the Dome Géa and Flore accumulations.

The combined cost of the two shallow wells is estimated to be US$ 40 million, based on the use of suitable rigs in the region that are being reviewed for the drilling programme. A summary of the respective well prognoses follows:

The long-lead items are already in Dakar and the Environmental Impact Assessment has been submitted to the Authorities. A geophysical site survey has been undertaken for the initial well site location and a geotechnical survey (drop cores) is underway for Q1 2015.

**The Opportunity:** Oryx Petroleum would now like to find a partner interested in earning up to a 40% equity in the Shallow PSC in return for a contribution to Oryx Petroleum’s past cost in the Shallow PSC (est. US$ 30 million gross) and funding all, or a portion, of the two shallow well programme planned for Q3 2015 (est. US$ 40 million gross). These wells will test both the Maastrichtian potential of the primary Dome Iris prospect, which is in around 20 metres of water, as well as modern appraisal of the existing Dome Géa heavy oil discovery, made by Total in the 1970s, when the last test of the oil viscosity was made from cores taken 30+ years ago.

Oryx Petroleum also recently announced its award of 85% interest in the AGC Central Licence PSC which lies immediately to the west of their Shallow Licence. It contains similar play to those successfully drilled by Cairn and ConocoPhillips in the offshore Senegal Sangomar block (SNE-1 oil discovery) and, although at a pre-farmout stage, could be included as part of a deal to participate in the Shallow Licence.

**Additional Information:** Access to the key data on this opportunity will be made available after execution of a Confidentiality Agreement (CA). Serious parties will subsequently be invited for a presentation and full data review in Oryx Petroleum’s technical office in Geneva.

All expressions of interest and requests for more information, including a copy of the CA for execution prior to access to the online data room, should be made through Envoi.

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THE GAMBIA
SENEGAL
SENEGAL
AGC CENTRAL PSC
Diapirs

Map of the AGC Shallow PSC

Location map of Africa

ATLANTIC

Location Map of the AGC Shallow PSC

Hydrocarbon prospectivity summary of relevant petroleum geology

Hydrocarbon shows:

MONTAGE SHOWING THE HYDROCARBON PROSPECTIVITY OF THE AGC SHALLOW PSC, OFFSHORE SENEGAL / GUINEA-BISSAU AGC

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