

## Offshore Suriname

### Shallow Offshore (SHO) Bid Round 2020/21

- **8 Blocks on offer over 13,524 km<sup>2</sup> of underexplored but highly prospective acreage in the western part of Shallow Offshore Suriname**
- **Acreage lies directly in the migration pathway between the giant onshore producing oilfields and the recent deepwater discoveries which are both typed to the ACT source kitchen**
- **1<sup>st</sup> Exploration phase 3D seismic obligations with Drill-or-Drop before 2<sup>nd</sup> phase drilling commitment**
- **Virtual Data Rooms Open 30<sup>th</sup> November 2020**
- **Bids Due by 30<sup>th</sup> April 2021**



**Introduction:** Envoi, as A&D advisor to Staatsolie, is pleased to confirm the announcement of Suriname's Shallow Offshore (SHO) Bid Round on the 16<sup>th</sup> November 2020. This encompasses eight blocks covering some 13,524 km<sup>2</sup> of the coastal waters of western Suriname immediately to the south of the significant string of recent deepwater discoveries in the Suriname-Guyana Basin, and to the north of the billion barrel in-place onshore oil fields.

Staatsolie is now inviting qualified international and national oil companies to bid for one or more of the blocks on offer, based on a minimum work programme obligation to acquire high resolution 3D seismic in the initial exploration phase, followed by drilling in subsequent phases. A 60% interest and operatorship is available in each block, where Staatsolie will be carried through exploration for its retained 40% equity.

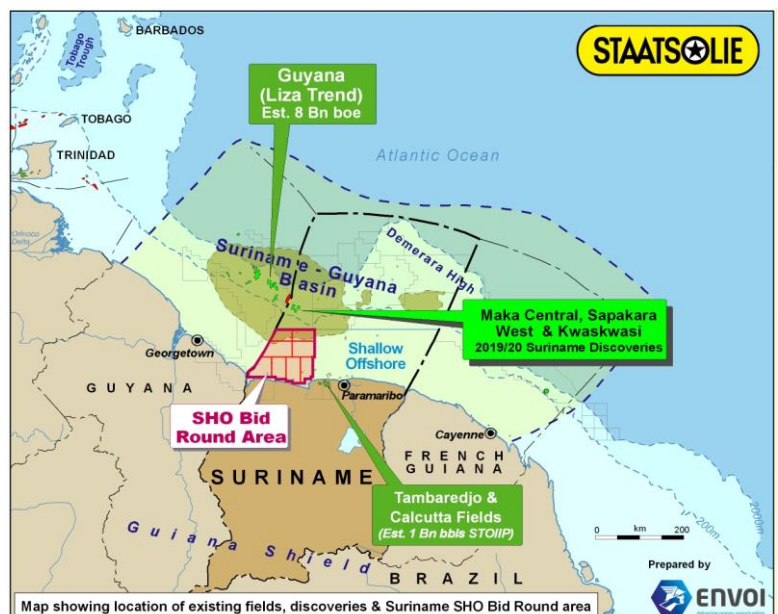
The shallow offshore acreage on offer is located in the migration pathway immediately updip from the mature Cenomanian-Turonian source kitchen which charged the fairway containing the Apache/Total Maka Central, Sapakara West and Kwaskwasi discoveries and where the Apache/Total Keskesi East and Shell/Petronas Sloanea wells are currently being drilled.

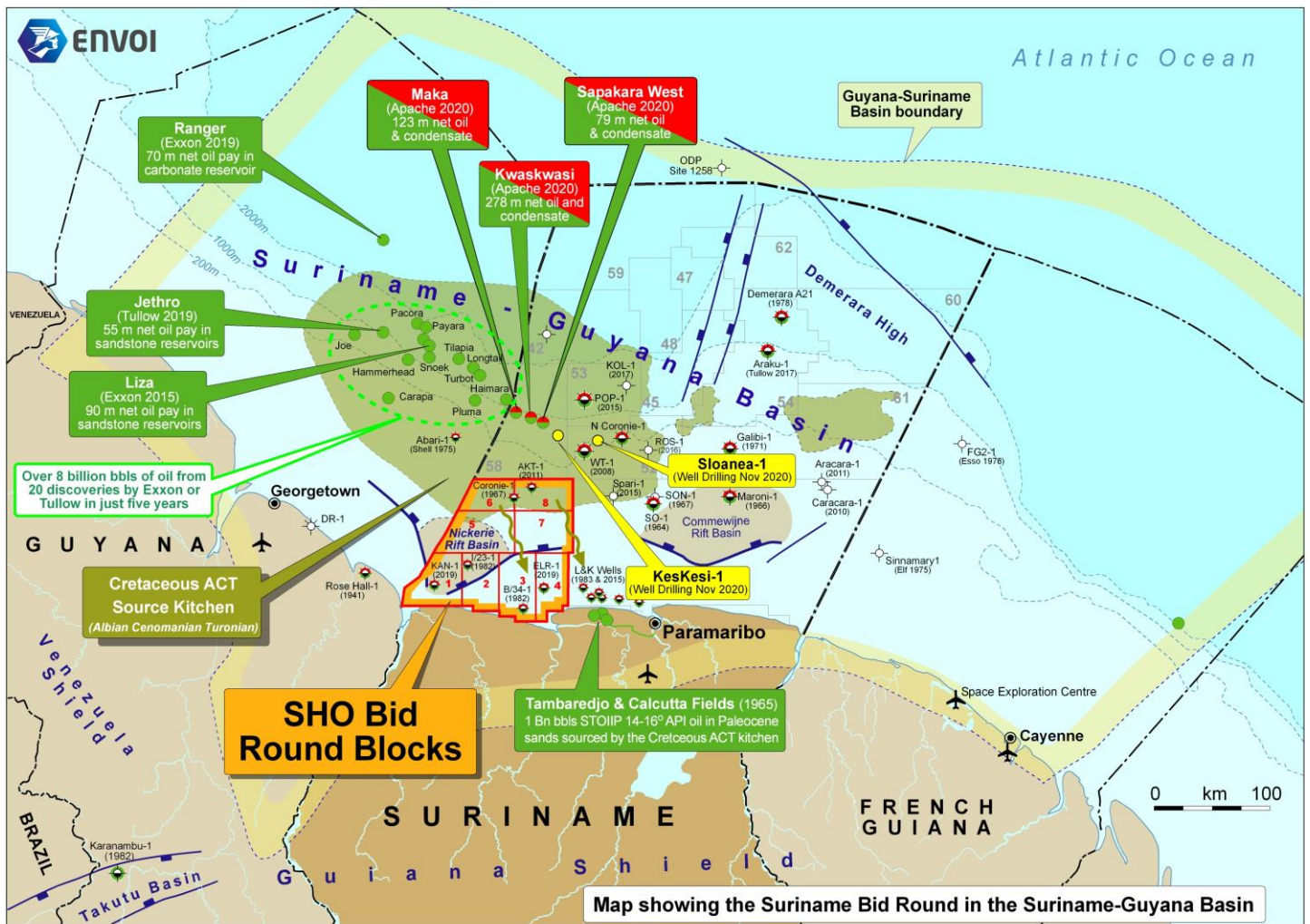
Significantly, the oil being produced from the Tambaredjo, Tambaredjo North-West and Calcutta oil fields onshore Suriname has also been typed to the Cenomanian-Turonian source rock, leading to the conclusion that oil from this source rock migrated through the largely undrilled shallow offshore acreage being offered. Additional Cretaceous and Jurassic sourced oils have also been typed in the onshore wells, demonstrating that the basin has multiple mature source rock intervals.

Other than a modest 3D survey on the shelf edge, the SHO Bid Round area is covered by a sparse grid of 2D seismic data and has seen only six historical wells drilled. Although all wells encountered hydrocarbons, this area is still considered underexplored. One of them, Aitkanti-1ST2, encountered 205m of shows in the Santonian equivalent to the deepwater discoveries, overlying another 87m of shows in the Albian.

Staatsolie's most recent evaluation has defined numerous stratigraphic and structural prospects over the SHO Bid Round acreage. These are not penetrated by the existing wells, offering large single and stacked play potential. High quality 3D seismic is now needed in order to unlock the full potential and define suitable drilling locations.

The Virtual Data Rooms are now open as of 30th November 2020 and will remain accessible to new authorised bidders until mid-March 2021, with bids due by 30th April 2021.





**Exploration History:** Although there are reports from the 1750's of the first Dutch explorers finding heavy oil seeps onshore Suriname, the first official mention of oil occurrence was not until 1928 in the Nickerie District on the coastal plain, close to the border with Guyana where heavy oil was encountered at around 100m in the shallow 300m wells being sunk at that time.

**Onshore Suriname:** Effective exploration started in the early sixties, when a number of IOCs became interested after oil was encountered at a depth of 160m during a water drilling campaign by the Geological Mining Department in 1965 in the area west of Paramaribo. This resulted in the discovery of heavy biodegraded oil (15 - 17° API) in the Lower Tertiary sands. These are composed of multiple fluvial and tidal inlet sands which are stratigraphically trapped in a structurally elevated area at what is interpreted to be the northern end of the NE-SW trending onshore Bakhuis Horst. With further drilling, the chance discovery went on to form the large (1 billion bbl STOIIIP) Tambaredjo, Tambaredjo NW and Calcutta field complex. Production from the Tambaredjo field commenced in 1982 at a rate of 200 barrels per day, with the Calcutta and Tambaredjo North West area subsequently coming onstream in 2007 and 2014. The 1,600 wells were producing around 17,000 bopd in 2016 where an estimated c. 115 MMbbls is thought to have been

produced from the Tambaredjo field alone with a further 80+ MMbbls remaining reserves.

*Key to the evaluation of the SHO Bid Round area is that although now biodegraded due to the very shallow trapping, the heavy oil in these onshore fields has been geochemically typed to the prolific, mature deep water ACT (Albian - Cenomanian - Turonian) source rocks responsible for the recent deep water discoveries in the Suriname-Guyana Basin which confirms that light oil has clearly migrated into, and through, the Cretaceous plays in the shallow offshore SHO bid round acreage.*

**Offshore Suriname:** The first phase of exploration offshore Suriname, mostly in the east, was carried in the 1960s by a consortium which included Elf, Exxon and Shell. Several seismic campaigns were followed by drilling which included the Suriname Offshore-1 well drilled in 1963, targeting the shallow Tertiary carbonates interpreted as reefs. Also, Maroni Offshore-1 and Suriname Offshore North-1 drilled in 1967 which were located on new 2D seismic over the outer shelf to further test the Tertiary carbonates evident on that data. Exploration gradually moved deeper into the offshore and resulted in the next phase of drilling including the Galibi Offshore-1 (1971), North Coronie Offshore-1 (1975) and Demerara A2-1 (1978). None of these wells encountered commercial hydrocarbons.





Renewed interest in exploration of the offshore Suriname-Guyana Basin by the international E&P companies was driven by a combination of the following key events:

- i) In 2000, the United States Geological Survey (USGS) estimated that the under-explored areas of the Suriname-Guyana basin could contain 13.6 billion barrels of oil and 32 Tcf of natural gas.
- ii) In 2007, a resolution was reached in the maritime boundary dispute between Suriname and Guyana after arbitration of the UN Tribunal of the Law of the Sea.
- iii). The boundary resolution coincided with the discovery of the Jubilee Field in Ghana on the conjugate margins of West Africa which triggered a series of other discoveries there and a recognition that similar petroleum systems could exist on the South American side of the Atlantic offshore Suriname and Guyana.

Subsequent exploration in offshore Suriname at that time was carried out by groups operated by various international E&P companies and led to the drilling of several wells, such as West Tapir-1, drilled by a Repsol operated consortium (involving Noble Energy) in 2008 immediately beyond the shallow offshore shelf. The well, which encountered oil show, TD'd in Lower Tertiary thus not penetrating the Cretaceous. Murphy Oil also drilled the Caracara-1 and Aracari-1 wells in the eastern part of the shallow offshore shelf in 2011 both targeting geological plays that Staatsolie's post well analysis has shown to be invalid.

More relevant exploration in what is now the SHO Bid Round acreage, includes the Aitkanti-1 (AKT-1ST2) well drilled by Teikoku Oil (Suriname) Co., LTD in 2011. This well has proven to be one of the important wells on the shelf with its discovery of light oil and condensate, which is further described below in the Outer SHO Shelf history.

The first significant commercial success offshore came in May 2015 when Exxon Mobil made the Liza-1 discovery offshore, on the Guyana side of the Suriname-Guyana Basin, encountering large resources of light oil in stacked Middle to Upper Cretaceous clastic reservoirs and was responsible for unlocking the plays in the deep-water basin. This play opening discovery has since led to a series of some 20 analogue 'string of pearls' discoveries offshore Guyana all exploiting the same play. Recently christened as 'the Golden Lane', these fields in Guyana contain an estimated 8 Billion bbls of combined oil equivalent including associated gas.

The extension of this proven Guyana play trend into Suriname was unlocked only in late 2019 by the Apache Maka Central-1 discovery. This encountered two pay zones containing light oil and condensate over a combined 120m+ interval of Santonian and Campanian sands. Total's farmin to the acreage followed, with two more discoveries being made since, by the Sapakara West-1 and Kwaskwasi-1 wells in

2020. A fourth well (KesKesi-1) is being drilled at the time of writing.

Shallow Offshore (SHO) Bid Round Acreage History: The western part of the shallow offshore covered by the SHO Bid Round acreage, sits very neatly between the proven billion bbl play areas of onshore and deep offshore Suriname, and through which the generated oil has clearly migrated, having been geochemically typed as the source of the large, now biodegraded, oil fields onshore Suriname.

Other than a modest existing 3D on the shelf edge in the western part of the SHO acreage, the present day Bid Round area is otherwise only covered by a sparse grid of 2D seismic data and has seen only 6 historical wells drilled. The SHO bid acreage is therefore considered underexplored, although each of the wells encountered hydrocarbons.

Inner Shelf Area: The first four wells were drilled in the nearshore part of the SHO area as a result of 1980s exploration by Gulf oil (acquired by Chevron in 1984) and Austra-Tex. These early wells included the I/23-1X well drilled in 1982 and the B/34-1X well drilled in 1983 that are located in what is now Block 2 and 3 of the Bid Round acreage respectively. The I/23-1X well targeted a stratigraphic trap within the Nickerie rift graben interpreted as a Jurassic objective, truncated by the prominent Cretaceous unconformity and sealed by overlying shales. Although light oil shows were encountered in the overlying Cretaceous clastic interval, no reservoir was encountered below the unconformity. By contrast the B/34-1X well was drilled to penetrate a down-thrown fault block structure and encountered trace oil shows in the Palaeocene and fair to good oil shows in a section of interbedded siltstones and claystones below the regional ACT (Cenomanian Turonian and upper Albian) seal.

A series of other nearshore wells drilled to the east of the SHO area between 1983-86 proved the extension of the onshore fluvial and tidal inlet plays close to the coast and immediately downdip from Staatsolie's large heavy oil fields but the wells were located on a very sparse grid of seismic data. Renewed exploration in 2015 led to sub-commercial discovery of heavy oil in stacked shallow lower Tertiary reservoirs across 5 wells.

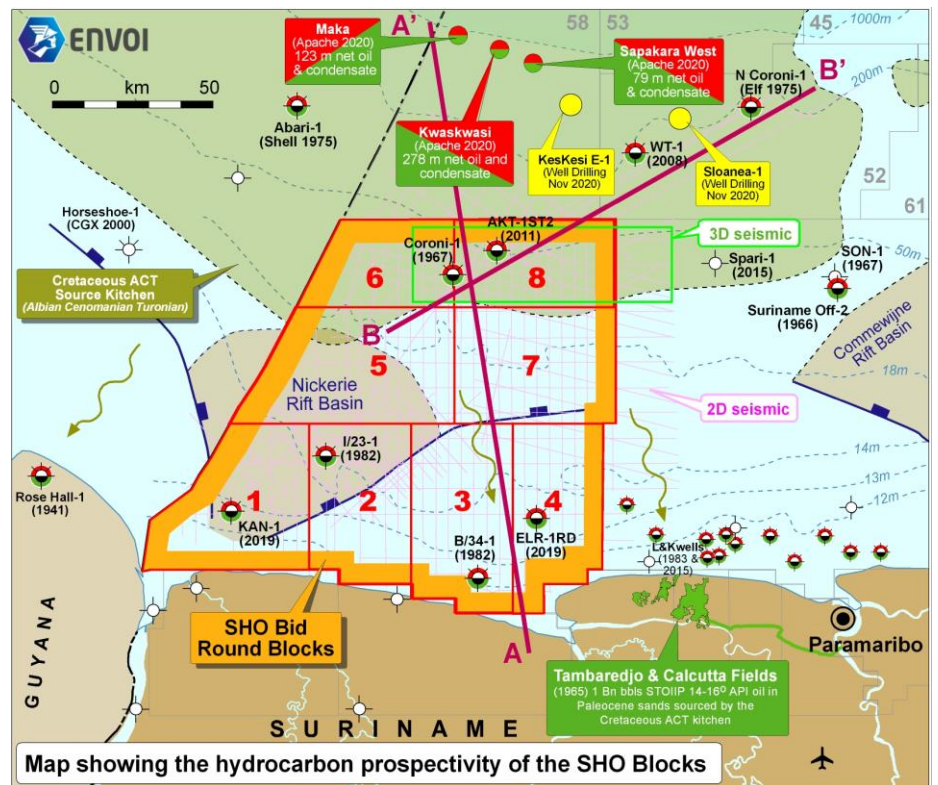
More recently in 2019, Staatsolie drilled two wells in the near shore areas of what is now the new bid round area. The Electric Ray-1 well (drilled in what is now Block 4) targeted a stratigraphic pinchout in the Albian and Tertiary. Good shows were encountered in the Albian together with a 2m "oil-down-to" in a Cenomanian-Turonian aged reservoir. The subsequent Kankantrie-1 well, drilled in what is now Block 1 targeting two stacked prospects involving truncated deltaic sands and a pinch out, but both encountered only very minor shows. Poor trap definition due to the very sparse 2D seismic coverage is now considered to have been the main



reason for failure of these wells and is a key driver for the requirement for new high resolution 3D seismic as minimum bid commitments in this SHO Bid Round.

**Outer Shelf Area:** Only two historical wells exist in the outer shelf area of the SHO Bid round acreage today. These comprise the Coronie-1 and the Aitkanti-1ST2 discovery well, which was considered uncommercial when drilled.

Coronie-1, on what is today close to the boundary between Blocks 6 and 8, was drilled in 1967 by Gulf Oil with stacked objectives including a primary Miocene reef and a deeper Upper Cretaceous fault closed prospect. It was the first well offshore Suriname to reach, and partially penetrate, the pre-Tertiary age strata. Modern interpretation of the existing seismic now shows there are no valid traps, but good shows were encountered in Cretaceous sands.



The most significant well in the SHO Bid Round acreage is the Aitkanti-1ST2 well, drilled more recently in 2011 by the INPEX operated Group. This well also had dual targets developed along the Cretaceous shelf edge controlled by the underlying transform fault trend. These comprised a primary Cenomanian/Albian carbonate "turtle back" anticline feature together with shallower secondary carbonate/sandstone targets in the Maastrichtian. The prognosed primary limestone objective in the Albian was variably argillaceous where penetrated but encountered shows over a gross 87 metre interval, from which a (52° API) condensate sample was recovered from a 1-2m limestone bed. Significantly, the well also unexpectedly encountered extensive oil shows over a gross 205m interval of interbedded turbiditic sands and shales in the Santonian-Campanian stratigraphy, from which a 37° API oil sample was recovered by MDT. This clearly indicates that the Upper Cretaceous turbidite equivalents of the recent deep-water discoveries are present and highly prospective where the updip remnants of these turbidites extend over the northernmost blocks on offer in the Bid Round.

The Spari-1 (SP-1) well was drilled by an INPEX operated group in 2015, immediately on strike to the east of the AKT-1ST2 well, to target a primary stratigraphic trap in these Upper Cretaceous Campanian turbidites (in which the AKT-1 well encountered significant shows). Where drilled, however, the section consisted mainly of claystone with upward-fining and dominantly fine-grained sandstones that appeared to be water wet based on the drill cutting returns. The deeper secondary Turonian slope fan sandstone objective was also water-wet. Oil inclusions were, however, identified in several porous sandstone samples shallower in the stratigraphy above 3,600m. In addition to the poor

primary reservoir, Staatsolie's recent interpretation based on the seismic reprocessed in 2018 also now suggests the original trap was invalid. Significantly, the SP-1 well is to date the only well yet drilled on the shallow offshore shelf specifically targeting the upper Cretaceous turbidite play that form the main reservoirs of the "golden lane" fields downdip in the Suriname-Guyana Basin. This new shelf play remains essentially unexplored in the SHO Bid Round acreage, in part because of very poor definition on the existing 2D and 3D seismic grids, and again emphasises the need for high quality 3D seismic data to unlock the true potential of this acreage.

**Regional Evolution & Tectonic Overview:** The history of the Suriname - Guyana Basin petroleum geology and in board shelf areas can be traced back to the initial break up of Pangea around 195 ma. The region's evolution can be defined in four key major phases as follows:

**Phase I - Jurassic:** During this time, the early break up of Pangea occurred with the Laurasian continent's separation from Gondwanaland caused by the North Atlantic rift system. This progressed southwards and opened the Central Atlantic, which resulted in rifting along the coast of Suriname and Guyana during that time

**Phase II - Early Cretaceous:** Continued rifting led to the subsequent counter-clockwise rotation of Africa with respect to South America and resulted in concomitant compression in north-eastern area of South America as the South Atlantic Ocean opened. This convergence caused uplift of the Demerara and Guinea Plateaus, inversion of the Jurassic rift grabens, and peneplanation of the Suriname-Guyana Basin.





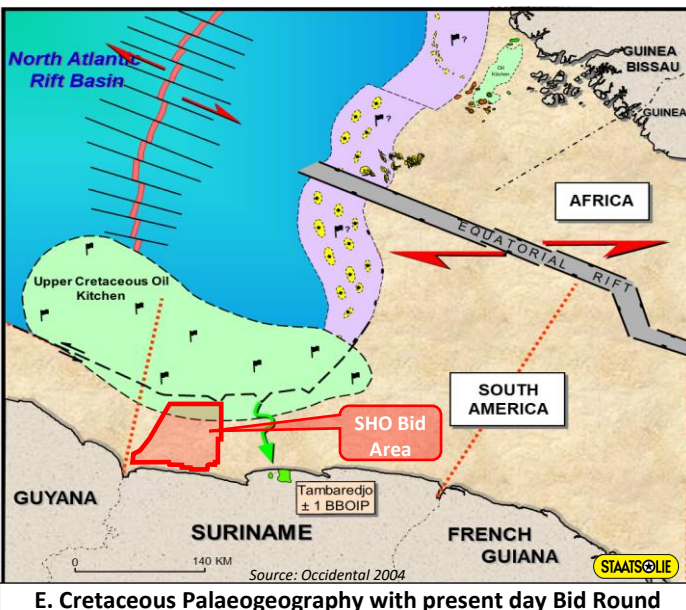
**Phase III - Late Cretaceous:** A second passive margin sequence developed along the Guyana-Suriname margin as the Equatorial rift spread and led to the Atlantic Ocean fully opening as Africa and South America finally split and drifted away from each other. The Guyana-Suriname margin has remained a passive margin since the Cretaceous, being filled with deltaic sedimentation.

**Phase IV - Miocene:** As the Nazca Plate in the Pacific Ocean pushed into the underbelly of the South American continent, it caused uplift of the western South America Plate. This event led to a shift in the discharge of the Amazon river system eastwards, first to the Amazon delta, and ultimately the coastal area of French-Guyana, Suriname and Guyana. Consequently, the previously sandy sediments of the Suriname-Guyana Basin were replaced by increasingly argillaceous deposits in deeper water and carbonates on the shelf.

**SHO Evolution & Petroleum Geology:** Detailed technical evaluation by Staatsolie consisting of interpretation of the historical seismic (reprocessed in 2018) and well data from its fields onshore and northwards over the shallow offshore acreage from inner to outer shelf into the deeper water, has unlocked a new understanding of the region's tectonic and stratigraphic evolution and key play prospectivity.

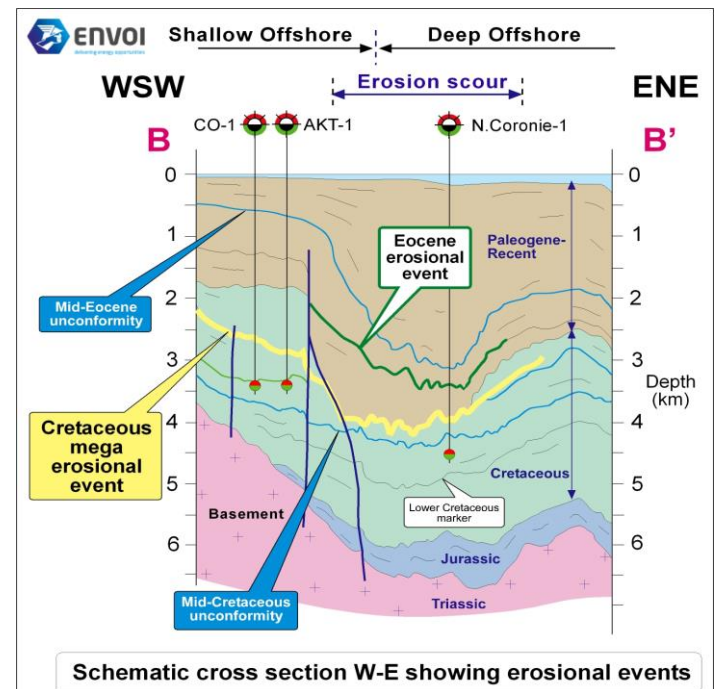
**SHO Evolution:** Four key stages of stratigraphic evolution (related to the regions macro evolution described above), are recognised in the shallow offshore that have shaped the key Bid Round play objectives (Ref: Stratigraphic column below). These key stages can be briefly summarised:

**Stage I - Lower Cretaceous (Berriasian - Aptian/Albian):** This saw development of outer shelf carbonate banks established as shallow marine conditions prevailed during the opening of the North Atlantic Basin (See: paleogeography map)



**Stage II - Lower/Upper Cretaceous (Albian - Santonian):** This saw a combination of shallow marine clastics from the paleo-Amazon river deltas, with long shore drift limiting distal deposition and extensive inshore clastic build up in the shallow offshore. Distal deposition of rich organic marine shales in deeper water beyond the carbonate shelf edge led to the formation of the Albian - Cenomanian - Turonian (ACT) aged shales which today combine to form the primary source rocks for the entire region.

**Stage III - Upper Cretaceous (Campanian - Maastrichtian):** Shelf margin collapse caused by the onset of hinterland inversion led to time transgressive erosion and creation of a regional scour base and unconformity that locally cuts down almost to the Albian. (See: Map above and Schematic section B-B' below showing this significant erosional event clearly evident on the shelf edge with local erosion of the entire middle Cretaceous stratigraphy). This shelf margin collapse resulted in massive sediment transport northwards into the deeper Suriname-Guyana Basin.



The resulting mass transport system/turbidite deposits and basin floor fans form the reservoirs being discovered in the deeper water today which are sourced by the underlying ACT source rocks. Turbidite channel deposits that fed the deeper water systems have also been deposited on the outer margins of the shelf as encountered by the AKT-1ST2 well were good shows were recorded.

**Stage IV - Cenozoic (Palaeocene - Recent):** Infill of the accommodation space left by the mass sediment loss into the deep water at the end of the Cretaceous has led to varying stratigraphy and prospectivity over the shelf and consists of an incised shelf sequence containing shallow marine clastics with clinofolds, evidence of the successive transgressive- regressive depositional regime.



**Petroleum Geology:** The resulting shallow offshore geology of the SHO Bid area can today be generally subdivided into the Inner and Outer shelf play areas. The petroleum geology comprises the following play elements:

**Source:** The primary source for much of the oil found in the Suriname-Guyana region appears to be the Cretaceous ACT (Albian-Cenomanian-Turonian) organic marine shales which are prevalent along the entire northern margin of South America, from the La Luna shale in Venezuela to the Canje shale in Suriname-Guyana. They are mainly responsible for the huge quantities of oil and gas found along this margin. Organic *prodelta shales* within distal submarine fans are correlated to a marine Type II source rock. TOC's range between 1-5% but are locally over 15% in units between 100m - to over 250m thick.

These source rocks have also been geochemically typed to be the primary source of the large, biodegraded Suriname oilfields. Oils from up to three other source rocks are well documented from other wells onshore Suriname, through the Shallow offshore (including a study on the AKT-1ST2 well) and including the deeper water Suriname-Guyana basin wells. Other potential source candidates include deeper Jurassic shales where preserved in the peneplaned grabens below the Cretaceous, and locally mature shales in the Lower and Upper Cretaceous. The Lower Cretaceous is known to contain a marine marl deposited under oxic conditions within a proximal marine setting where continental organic matter dominates, deposited in a *lagoonal* environment associated with mudstones and wackestones.

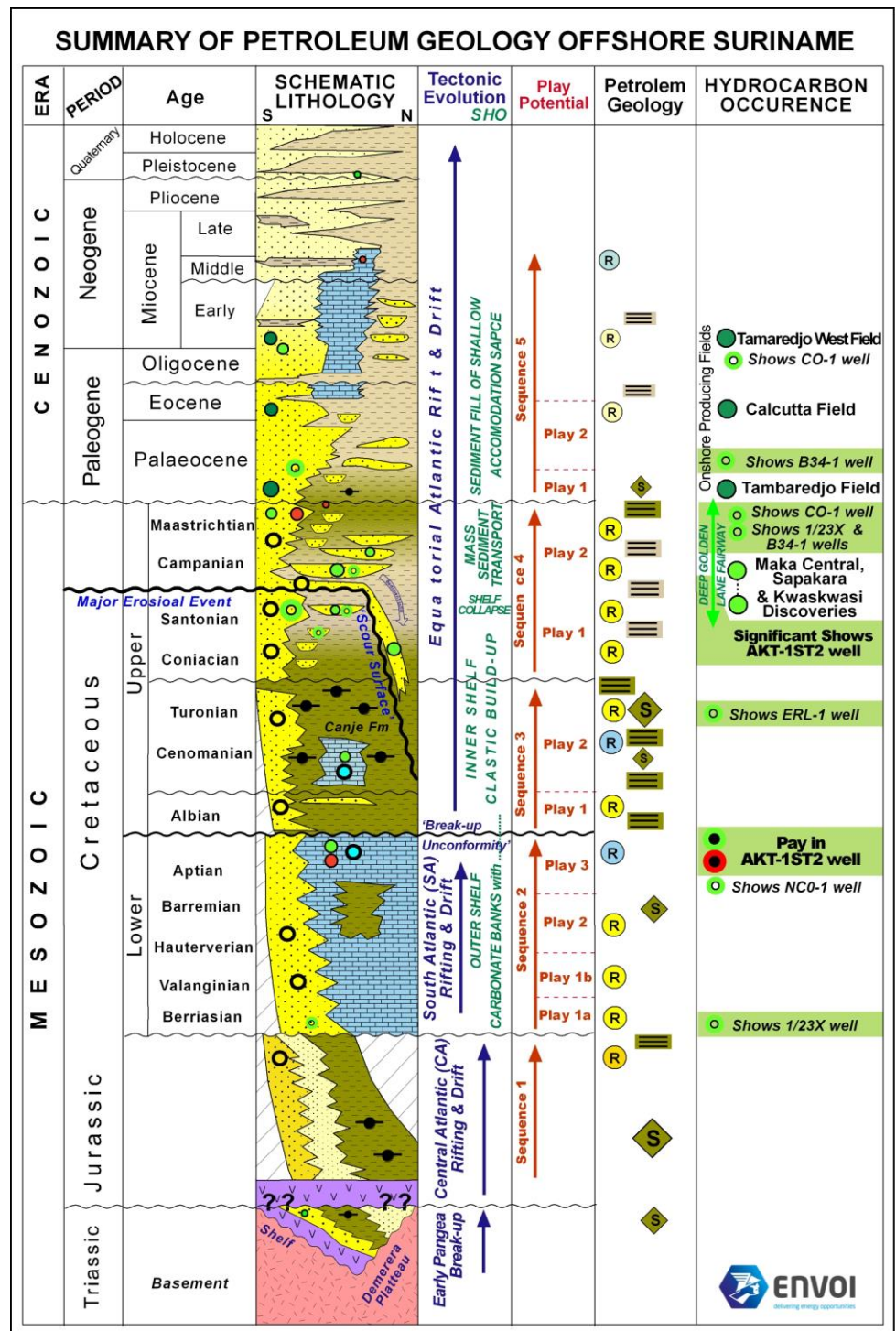
Basin modelling suggest that the deepest source rocks may have matured in the early Cretaceous, whereas the ACT source rocks reached maturity in the early Tertiary by which time most of the stratigraphic traps with minor local fault related closure in the shallow offshore were already in place.

With respect to timing it is key that the traps in the SHO Bid Round area generally predate the phases of hydrocarbon generation and migration from the various source intervals. The fact that migration is

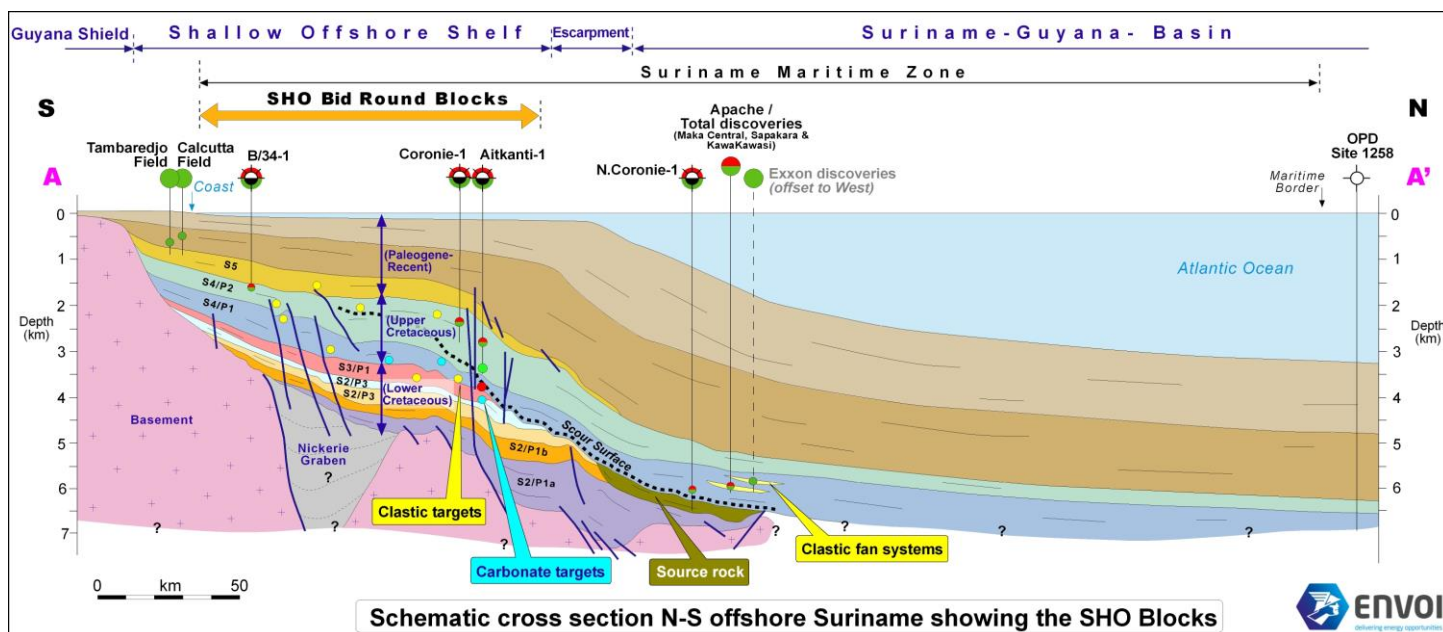
known to have occurred throughout the whole area renders source risk very low indeed.

Trap definition is considered the prime risk in the area as demonstrated by the few historical wells located on the sparse vintage 2D and limited 3D data. This is the main reason why new modern high-resolution 3D seismic is now essential to unlock the SHO play area.

**Reservoir & Seals:** A total of 5 potential stacked play sequences have been recognised by Staatsolie over the Shallow Offshore area from Jurassic to lower Tertiary (Ref: Stratigraphic Column) These are regionally distributed and their presence dependent up on the local deposition and unconformities.







*Sequence 1* consists of potential Jurassic clastic reservoirs in the Nickerie Graben below the Cretaceous in the inshore SHO area although none have yet been penetrated by the two old wells that have historically targeted these.

*Sequence 2* comprises Lower Cretaceous deltaic & estuarine sands objectives in the inshore part of the Shallow Offshore area, whilst shallow marine carbonate reservoirs are evident to the north of existing wells and facies analysis of the seismic. Sands exhibit modest poro-perms up to 10% and up to 10mD.

*Sequence 3* comprises Albian to Turonian deltaic to estuarine reservoir sands in the Inner Shelf area together with proximal equivalents to the deep water turbidite play that infilled the accommodation zone left by the shelf collapse in the Outer Shelf area. Evidence of regional flooding events can be seen on the seismic. Shales are deposited by transgressive - regressive cycles which effectively seal underlying sands in stratigraphic and structural traps associated with minor faulting. Well evidence suggests moderate to very good reservoir potential with porosities ranging from 5 - 20% and up to 200mD. Wells in the outer shelf confirm the deposition of carbonate reservoir at this time. Poro-perms range up to 15% but generally less than 10mD.

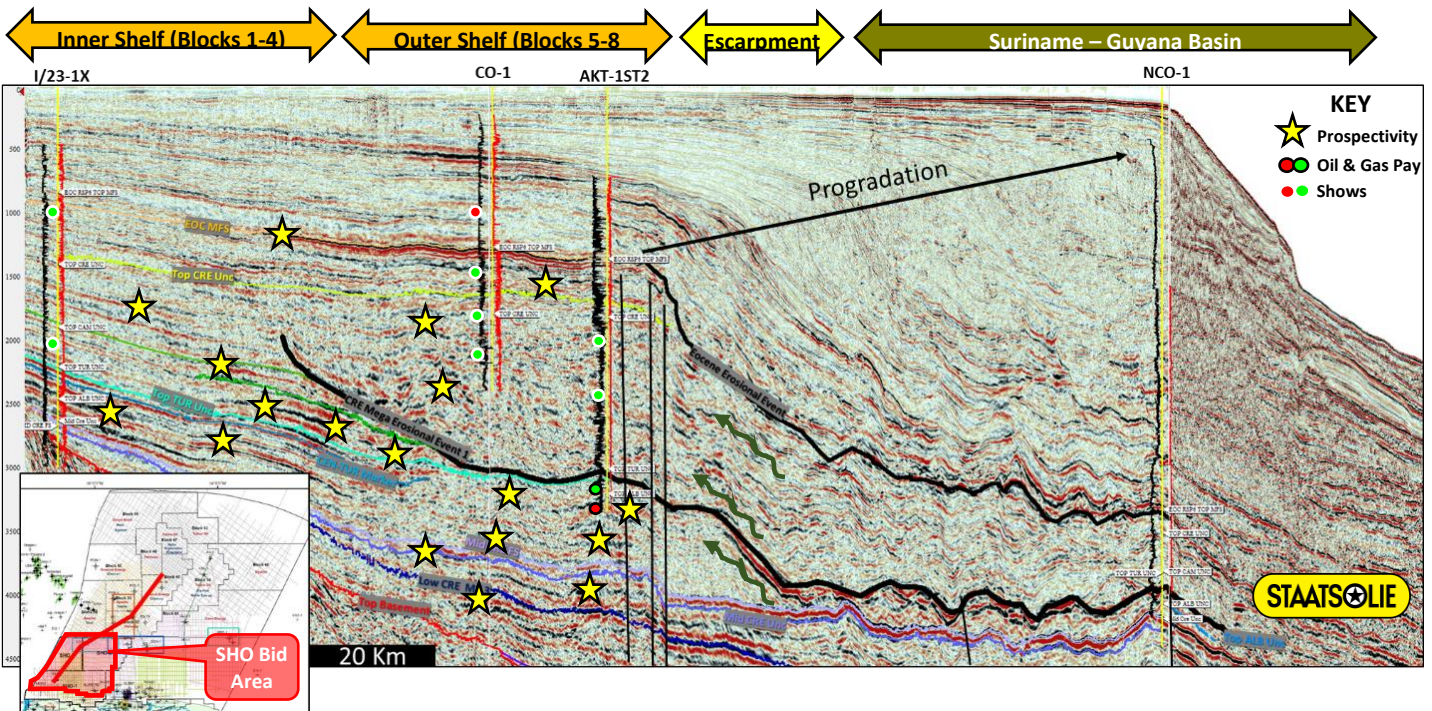
Albian and Cenomanian-Turonian flooding surfaces can be identified on well data and form laterally extensive regional seals over the shallow offshore, which are the equivalent interval to the world class Canje source rocks deposited in the deep water Suriname-Guyana basin during a global sea level rise and Oceanic anoxic event.

*Sequence 4* consists of Upper Cretaceous, Coniacian to Maastrichtian aged deltaic-fluvial channel sands exhibiting moderate to excellent reservoir potential. These have been reworked and latterly deposited into the deeper water basin following the shelf margin collapse during the Campanian.

These are today proven by the many recent discoveries including those in Suriname made in late 2019 and 2020. They include the Maka Central-1 well, which encountered a 50m light oil and gas condensate column in Campanian sands and a 73m oil column in the Upper Cretaceous Santonian clastics. The subsequent Sapakara West discovery well was drilled in 1,400m of water and reached TD at 6,300m, encountering 79m oil and gas condensate pay in the Campanian and a 36m (API 40-45°) oil leg in the Santonian. In addition to the oil in the Santonian and lighter oil and gas condensate in the Campanian, the Turonian was also a potential target at Maka Central but with a TD at over 6,000m is understood to have been beyond the limits of the rig. Following the two shallower discoveries, the Turonian remains a future deeper objective.

The updip equivalents of these proven Upper Cretaceous clastics were encountered on the shelf in the Coronie-1 and the Aitkanti-1ST2 wells with good and significant shows respectively that confirmed their presence and potential as future primary reservoir targets. While penetrated by these two wells, neither were located optimally having been drilled targeting the deeper carbonates. This sequence is the other primary reservoir target in the Outer Shelf blocks due to the stacked but thin non-commercial oil and gas condensate columns encountered in the AKT-1ST2 well. Poro-perms can be very good and range between 10-30% and over 200mD.

*Sequence 5* comprises delta front to estuarine sands deposited between upper Cretaceous Maastrichtian to Tertiary Eocene times with excellent quality potential. Poro-perms range between 20 - 40% and locally over 500mD. An increase in carbonate deposition towards the upper part of the sequence is evident from well and seismic data but not thought to have any material reservoir potential. Flooding surfaces in the Eocene define regional sealing shale units across the shallow offshore region.



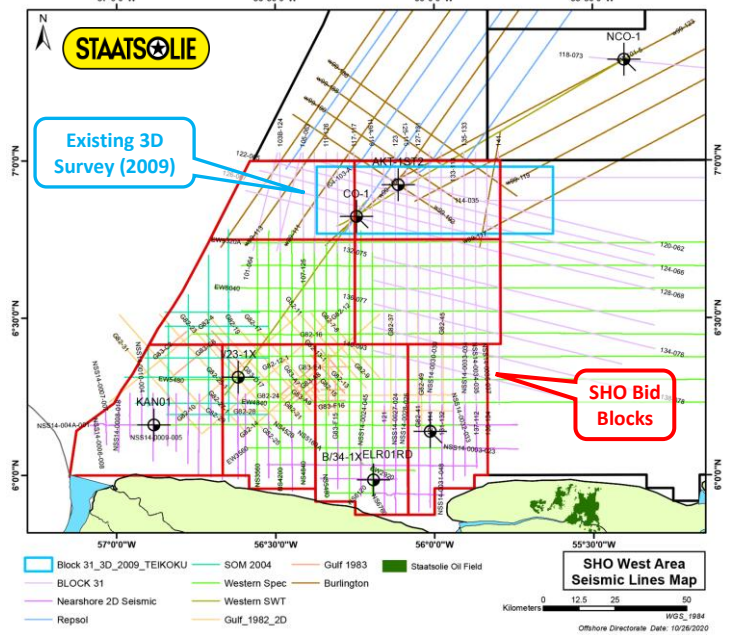
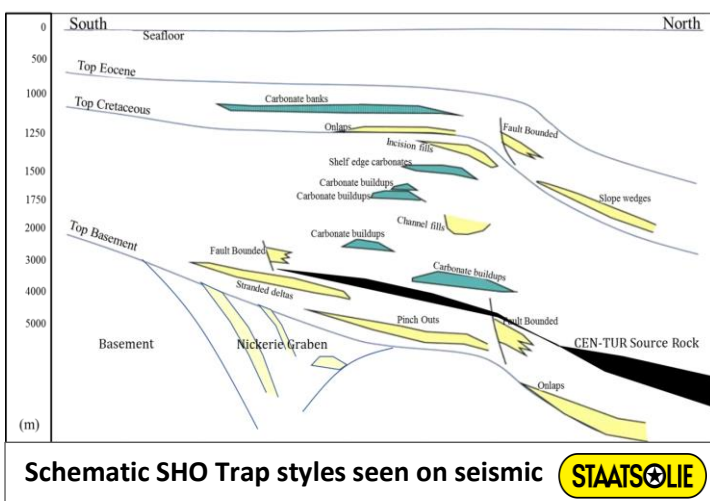
**Structure & Timing:** Structure in the shallow offshore include prominent potential for stratigraphic traps, either by lateral limestone facies changes and build-ups on the shelf edge, with depositional pinchouts updip in the direction of the original sediment source.

**SHO Prospectivity:** The SHO acreage offers considerable potential with numerous prospects and leads exhibiting stacked Cretaceous play potential in a variety of traps mapped by Staatsolie on the existing reprocessed seismic data.

Channel complexes on the shelf in the Upper Cretaceous are also targets, where canyons created by the Campanian incisions observed on seismic have been filled with clinoformal sediments. Fault related terraces form more subtle trap potential back on the inner shelf. The following schematic highlights the multiple range of trap and stacked play potential mapped by Staatsolie on their reprocessed seismic potential over the shallow offshore bid round acreage:

**Seismic Data Coverage:** There is a modest ~2,000 km<sup>2</sup> area of 3D data acquired in 2009 on the shelf edge, mostly covering Block 8 and the extreme eastern part of Block 6.

The rest of the seismic data over the SHO Bid Round blocks consists of 15,000 line km of 2D data. These were acquired in some seven different surveys between 1982 and 2012 and were all reprocessed for Staatsolie by DUG in 2018 to form the basis for the current evaluation.







**Lead & Prospect Potential:** Staatsolie's technical evaluation of the entire shallow offshore including basin play modelling and interpretation of the reprocessed seismic has been instrumental in preparation of the SHO Bid Round area now on offer.

In the outer shelf SHO area including Blocks 5 to 8, the primary prospectivity consists mainly of Albian/Aptian carbonate banks overlain by prospective Santonian clastics (equivalent to the large proven deep-water discoveries).

This transitions to multiple stacked Cretaceous clastic plays set up by combined faulting and stratigraphic traps. This section thins southwards in the inner shelf SHO area covered by Blocks 1 to 4. The regional geosection above which runs NE-SW across the SHO Bid Round area, over the escarpment and into the Suriname - Guyana Basin indicates the general stratigraphy in which Staatsolie has been able to identify Cretaceous leads and prospects as well as other significant geological features. Below this interval the NE-SW oriented Nickerie Graben mapped within the inner shelf acreage, is also modelled to contain a localised potential mature Jurassic source interval.

Staatsolie's most recent evaluation of the area, albeit based on a sparse 2D Seismic grid, has defined numerous prospects and leads within the SHO acreage which have not been penetrated by the few existing wells and offers large single and stacked play potential.

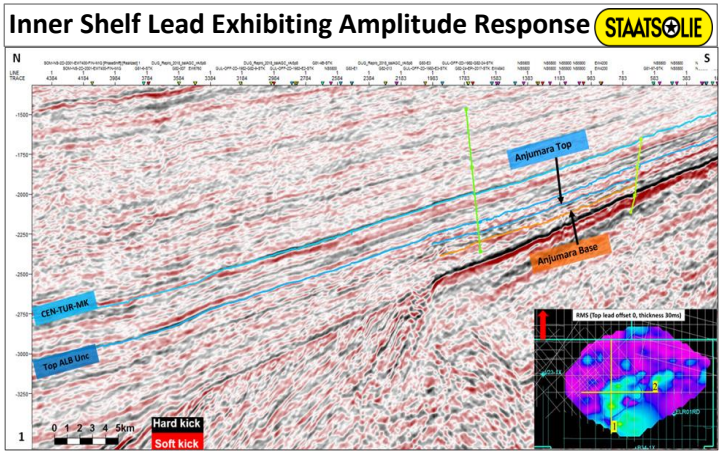
The entire SHO area now needs modern 3D seismic coverage to map each play sequence accurately which will allow the upgrade of the existing leads to drillable prospects. New 3D will also enable several one line leads to be developed as well as the definition of new ones which cannot currently be mapped due to the sparse 2D grid. *This consists of 15+ km spacing in places which is insufficient coverage to be able to map some of the smaller albeit stacked individual prospects and accurately map the larger ones.*

The following are some examples of the leads and features that have been observed on the existing seismic data as well as features that now need the new 3D.

**Inner Shelf Examples:** The following shows clear evidence of the nearshore faulting that sets up the potential for combination traps being formed sealed by the regional

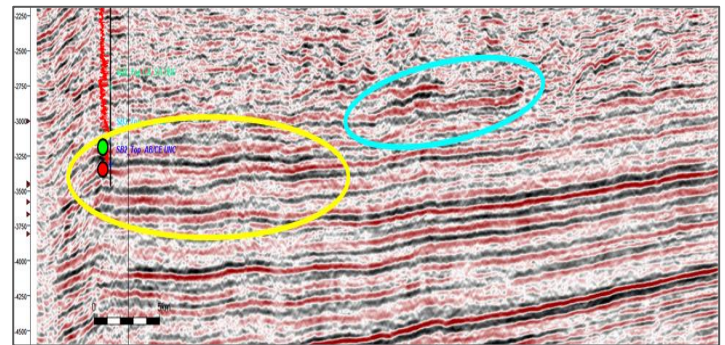
Cretaceous flooding events being laterally offset by faulting to set up dip/fault closures.

These locally exhibit amplitudes associated with updip pinchouts of the northerly thinning clastics in this example:

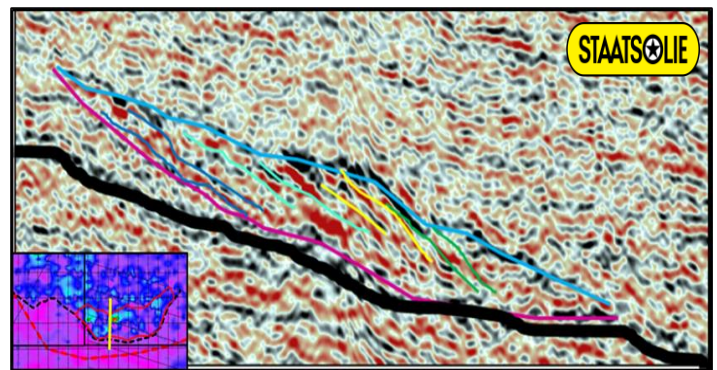
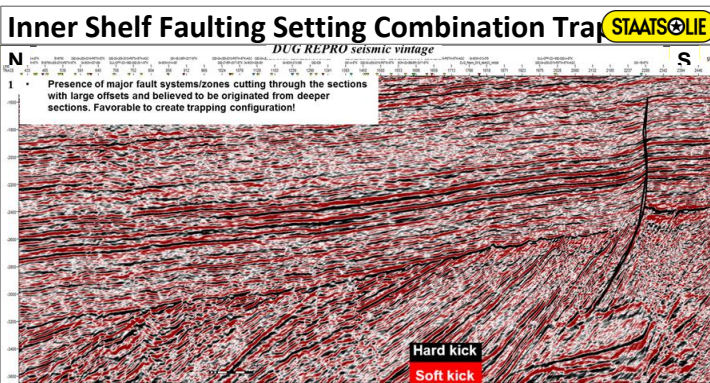


**Outer Shelf Examples:** The existing wells on the northern part of the shelf edge have not only defined oil and gas condensate columns as in the example below, but also so undrilled features on strike illustrated by the condensate interval encountered by the AKT-1ST2 well which is expressed as a high amplitude-low frequency interval. Similar seismic observations are seen updip of the well and in younger stratigraphic intervals.

AKT-1 ST2



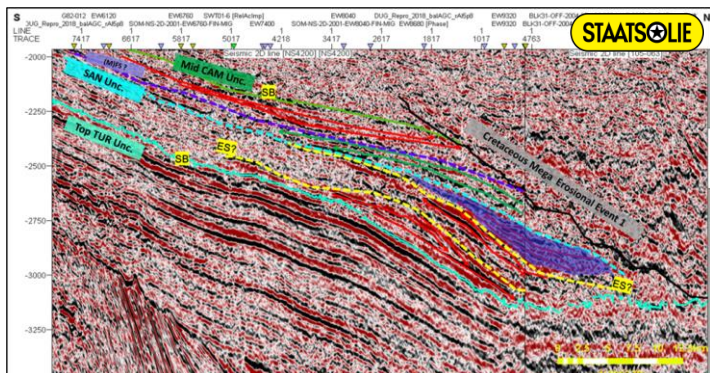
A host of features are also evident in the middle Cretaceous behind the carbonate banks both above the major unconformity in the upper Cretaceous that have exploited the resulting scour surface as in this example;



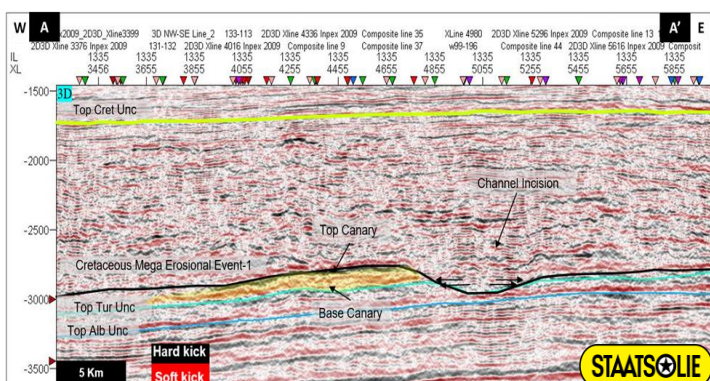




Also, prospectivity below the erosional surface in the middle and lower part of the Upper Cretaceous where cliniform features can clearly be seen;



As are amplitude supported features below the surface and remnants of the regional erosional event in the Campanian, best seen below in a strike line.



These are just a few examples of over 20 Prospects and Leads mapped by Staatsolie on the existing seismic.

**Resource Potential:** The prospective 'Mean' recoverable resource potential of the individual leads and prospects mapped is estimated to range between 75 and 500 MMbbls, with upside ranging from 100 MMbbls to over 1 billion bbls which measures well against the expected field size distributions of conjugate margin analogue shelf plays along the west African margins.

**Commercial:** Staatsolie's technical evaluation has been run hand in hand with an evaluation of the commercial terms needed to ensure commerciality of the full range of prospect resource sizes that can be expected within the shallow offshore plays. Although some plays have significant resource potential, the PSC terms have been specifically set for SHO Bid Round blocks to ensure that even modest discoveries can be commercialised.

The shallow water and ability to drill wells with jack-ups already ensure wells will cost significantly less than in the deeper water Suriname-Guyana basin. Development CAPEX will also be much less in the shallow water and proximity to the coast further enhances the commerciality of any shallow offshore discoveries.

A 60% working interest and operatorship are available in each of the 8 Blocks in the Bid Round where Staatsolie will be carried for its 40% share of the work programme through exploration in each block awarded.

**Bid Round Process & Timeline:** The Bid Round terms have also been set for carefully sized blocks to ensure large, mid-sized as well as small, qualified E&P companies can participate in the round. The priority is the acquisition of new 3D surveys (considered essential to unlock the shallow offshore plays) in the initial exploration phase where market analysis indicates that the costs of acquiring suitable 3D seismic have come down dramatically after the recent downturns with prices now as low as US\$ 4,000 km<sup>2</sup>.

The bid round is competitive where initial bid evaluations will be based on bidders offering at least the 'minimum 3D work programmes' in each block. However, additional biddable items include signature bonuses, additional 3D seismic and early commitment to drilling all adding points to increase the chance of award.

Staatsolie is keen for all experienced E&P companies, IOCs and NOCs to be able to review the SHO Bid Round blocks without hurdles. As a result, once interested parties have been authorised as having the E&P experience and necessary resource by way of the simple registration process and have signed the Confidentiality Agreement (CA), all Companies will then have unencumbered access to the available SHO data via the Geotechnical Virtual Data Room (GVDR), after attending a short virtual pre-data room presentation by Staatsolie, coordinated by Envoi.

Each authorised bidder will also be offered one day free access to the Petrel seismic project containing all the existing 2D and 3D data, via separate remote virtual seismic workstation (SWVDR). Days will be allocated on a 'first come - first served' basis. Thereafter, additional SWVDR access can be acquired based on a rate of US\$ 5,000 / day. All the SHO data including the Petrel project can also be accessed for the full duration of the Bid Round by simply purchasing a licence for the SHO Bid Round Data Package for US\$ 30,000 as detailed in the detailed 'Instructions to Bidders'.

Staatsolie has allowed 4 months for interested parties to register before the data rooms close to new entrants in mid-March. A total of 5 months is available for those engaging early, once the VDRs are open from 30<sup>th</sup> November 2020 and before bids are due at the end of April 2021. Authorised bidders in the GVDR by the mid-March 2021 registration deadline will have access to the data in the GVDR until the bid deadline at 12:00 Suriname time on Friday 30<sup>th</sup> April 2021.





**Additional Information:** Interested parties are encouraged to download and review the 'Instructions to Bidders' document (issued on 16<sup>th</sup> November 2021), which details the complete Bid Process, all the terms and timeline.

Both the Registration Form and CA required as a first step, are to be completed for participants to be recognised as 'authorised bidders', and can be accessed via the following Staatsolie Bid Round web page:  
[www.staatsolie.com/en/suriname-sho-2020-2021-bid-round/](http://www.staatsolie.com/en/suriname-sho-2020-2021-bid-round/)

This Synopsis and links to Staatsolie's Bid Round web page are also accessible from Envoi's website via the follow link:  
[www.envoi.co.uk/suriname](http://www.envoi.co.uk/suriname).

As Envoi has been appointed by Staatsolie as A&D advisor and the 'primary contact' for the SHO Bid Round, please address **all** queries by email to ENVOI in London, copied to Staatsolie as per the email addresses below::

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