Report for:

The Minister for Communications, Climate Action and Environment

Assessment of financial responsibility - CNOOC Well 52/04-A (Iolar)

In association with:

Well Management and

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0. Introduction & Executive Summary

This Final report describes the assessment of the application by CNOOC Petroleum Europe Limited, formerly Nexen Petroleum U.K Ltd (the 'applicant') for approval to drill a well in the Porcupine Basin Block 52/04 A (Iolar) under Frontier Exploration Licence (FEL) 3-18, as described in their letter of 25th January 2019 and attachments (Reference 1), with respect to ensuring the applicant has adequate financial provision to cover liabilities potentially deriving from the applicant's offshore activities, including effective emergency response and subsequent remediation and potential economic damages (where such liability is provided for by national law) as required by EU Directive 2013/30. The assessment method and protocol is described in Reference 2. This report describes the basis upon which a recommendation can be given to the Minister to accept the Financial Responsibility arrangements.

The letter of 25 January 2019 (Reference 1) and Financial Responsibility Report (FR) Report 8th January 2019 (Reference 3) refer to "the DCCAE guidelines" as issued on 26 June 2017 (Reference 2).

Further information on the insurance arrangements has been received from CNOOC (Reference 5) and its partner, Exxon (Reference 6)

The completed assessment protocol is given in full in Appendix 1. This text contains a summary.

The overall conclusions of the assessment are:

- The cost and duration of well control using a capping stack are addressed appropriately. …..

- The cost of drilling a relief well has been addressed appropriately.

- The modelling work is appropriate and consistent with good practice. The worst case modelling has assumed a spill is in winter conditions, thus overestimates surface spreading and beaching of oil.

- Spill response & clean-up cost estimates (including studies & impact assessments) have been assessed in accordance with the guidance and are conservative.

- The cost of damage to fisheries and aquaculture may underestimate the costs to aquaculture but the underestimation is likely smaller than overestimates in other areas.

- Other economic costs considered include the costs to tourism which have been estimated appropriately as a proportion of all Ireland tourism. (Other impacts e.g. to coastal industry and power stations have been discounted on the basis of distance and time of travel given the nature of the oil expected).

- The applicant has omitted consideration of the proximity of the well site to marine SACs (e.g. Belgica Mounds Province SAC, Hovland Mound Province SAC, & South-West Porcupine Bank SAC), but this is not material to the financial estimate.

In conclusion, the applicant's overall FR estimate [redacted]) is reasonable. A small number of concerns have been raised about the basis of this estimate. However, none of these concerns are material to the overall FR figure, given that the volumes of oil spilled are high-end estimates.

The applicant has provided evidence that suitable insurance cover is in place.

1. Capping Stack

The report prepared by the Applicant has comprehensively addressed all the items which have been requested within the Financial Responsibility – Assessment Protocol with respect to the potential requirement to mobilise a capping stack in the event of a major well control incident during the drilling of the subject well and has therefore adequately responded on all the issues raised.

Whilst the provisions made by the applicant meet the requirements for a worst case scenario, we have identified a couple of supplementary comments which the applicant may wish to consider as practical issues related to the provision of the capping stack and associated equipment and services;

1. Given the steaming time from Montrose to the well site (between 2 and 3 days) the applicant may wish to consider maintaining subsea dispersal equipment on standby at the shore base in Ireland with the existing marine logistics vessels having the capability to deploy this equipment in order to provide a more immediate dispersal solution in the event of a spill event occurring.

2. In choosing the specialist shipbroker the applicant should consider utilising brokers who have recent previous experience of operating in Irish waters and in particular good working knowledge of the taxation regulations applicable to foreign owners chartering into Irish waters.

2. Relief Well

The report prepared by the Applicant has comprehensively addressed all the items which have been requested within the Financial Responsibility – Assessment Protocol with respect to the potential requirement to drill a relief well in the event of a major well control incident during the drilling of the subject well. The provisions made by the applicant covering the provision of a relief well in the event of a blow out are sufficient and all in accordance with best industry practice..

3. Spill Modelling

The spill modelling work appears to be sufficient to provide a worst-case assessment of the consequences of a blowout. Although there are one or two data gaps (described below) these are unlikely to result in a material change to the conclusions:

1. In relation to this modelling work, the Assessor believes that the Applicant has referenced the latest version of the Safety Case and that this is the version upon which CER has issued a Safety Permit.
2. The Applicant has provided justification for their choice of model. The Assessor believes that this justification is reasonable.
3. Although the applicant has not provided a justification for their choice of blowout flowrate, the flowrate that can be inferred from the data provided is in excess of notional flowrates used in other jurisdictions for wildcat exploration wells.
4. The [redacted] is consistent with the time taken to drill a relief well. Since, in practice, it is likely that the well would be brought under control earlier than this (e.g. by deploying a capping stack), this represents a high-end estimate of the amount of oil released.

5. If the quoted release longitude is (then the modelled release location is not materially different to the proposed wellsite location. The decision to model a subsea release is reasonable.
6. has been completed sufficient to identify a reasonable worst-case scenario.
7. The applicant has provided justification for their choice of metocean data. This choice is reasonable. However, no information has been provided on the amount of data used. As an example, UK guidance requires using a minimum two-year time series data-set.
8. The worst-case scenario deterministic run modelling work is sufficient to identify all potentially impacted shorelines, environmentally sensitive marine & coastal environments, marine protected areas, including any transboundary impacts.
9. The model outputs provide sufficient information to identify the fate and associated volumes of oil spilled.

4 Oil Spill Response & Clean-up

The applicant's estimates of worst-case cost of oil spill response, clean-up and associated scientific studies is reasonable.

1. As described above, the spill duration is based on the time to drill a relief well; the well is likely to be under control well before that amount of time has passed. Moreover, the worst-case run appears to be a winter run. The spring & summer equivalents (when the well is to be drilled) result in significantly smaller geographical spread and smaller quantities of oil beached.

5 Impacts on Fisheries and Aquaculture

The applicants estimate of worst-case cost of impacts on fisheries and aquaculture is reasonable. Although discrepancies have been identified in relation to cost of aquaculture impacts, these are not likely to be material to the overall conclusion:

[redacted]

6. Other Economic Impacts

The applicant's estimate of worst-case cost of other economic impacts [redacted] is reasonable.

1. Of all the potential additional economic impacts of oil spillage, the applicant believes that only tourism impacts are likely to be material - this is a reasonable conclusion.
2. Potential tourism impacts are difficult to quantify. However, the applicant has based their assessment on Irish guidance and guidance also in place in the UK.

7. Financial Responsibility (FR) Cost Estimate

The following table summarises the sums assessed:

[redacted]

** Costs of impact studies and monitoring has been included in the Clean-up sum.

The applicant's overall FR estimate [redacted] is reasonable. A small number of concerns have been raised about the basis of this estimate. However, none of these concerns are material to the overall FR figure, given that the volumes of oil spilled are high-end estimates.

8. Insurance

CNOOC has elected to procure insurance to cover the potential liabilities resulting from an oil spill. CNOOC propose specific arrangements to cover prompt payment of legitimate claims

8.1 Insurance Cover

The completed Insurance Assessment Protocol Checklist is located in APPENDIX 1.

Our review concludes that the evidenced insurance coverage documents demonstrate compliance with requirements and is therefore acceptable. See details in Appendix 1.

8.2 Prompt Payment

The applicants CNNOC and ExxonMobil have robust insurance arrangements in place with recognised specialist insurance companies. Whilst we have not been made aware of any special claims handling arrangements for the exploration well under review, we have no reason not to believe that claims handling will be handled with all necessary process, given the expertise of the applicants.

9. References

1. "Financial Responsibility Assessment" Letter from CNOOC Petroleum Europe Limited to PAD, DCCAE dated 28th January 2019.
2. Method for assessment of financial indemnity/insurance of petroleum authorisation holders. Report to The Minister for Communications, Climate Action and Environment by Astrid Consulting, NRG Well Management and INDECS Consulting. 26th June 2017.
3. Environmental Support to Drilling in Irish Waters, Financial Responsibility, Nexen Petroleum UK Ltd. Xodus Report A-100460-S00-REPT-007, 8th January 2019
4. BIM (2018) BIM Annual Aquaculture Survey 2017 , Bord Iascaigh Mhara http://www.bim.ie/media/bim/content/publications/aquaculture/BIM-Annual-Aquaculture-Survey-2018.pdf
5. Emails From: [redacted] Sent: 12 March 2019 09:53 and 28 February 2019 16:18 To: [redacted], PAD Licensing; Subject: RE: Financial Responsibilities Assessment CNOOC
6. Email From: [redacted] Sent: 21 March 2019 14:24 To: PAD Licensing Cc: [redacted]; Subject: FEL 3/18 Iolar (52/4-A) Financial Responsibility

Appendices

The following Appendices are included for additional information:

APPENDIX 1 Completed Assessment Protocol

APPENDIX 2 Glossary of Abbreviations and Acronyms

APPENDIX 3 Assessment Protocol etc

APPENDIX 1 COMPLETED ASSESSMENT PROTOCOL

FINANCIAL RESPONSIBILITY - ASSESSMENT PROTOCOL			
A. TECHNICAL & SPILL COST			
This review has been completed based upon the CNOOC Petroleum Europe Ltd (Ex Nexen Petroleum UK) Document No. A-100460-S00-REPT-007 RevA02 dated 8 Jan 2019 commissioned from Xodus Group.			
No	***Protocol Element***		***Observations & Recommendations***
1	**Capping Stack**	❖ Has the applicant made contractual arrangements guaranteeing access to suitable capping stack equipment?	The applicant has contractual arrangements by means of a Master Services Agreement with Wild Well Control Incorporated (WWC). This provides the applicant with access to a 18-3/4", 15,000 psi capping stack complete with 3 single blind rams. This capping stack along with associated debris removal equipment and dispersant equipment is all available for immediate mobilisation from WWC's facilities in Montrose, Scotland.
		❖ Has the applicant made contractual arrangements for the deployment of the capping stack, associated debris clearance and subsea dispersal equipment and suitably qualified personnel to ensure optimal utilisation of this equipment?	The contractual arrangement with WWC includes the deployment of the capping stack, associated debris clearance equipment and subsea dispersal equipment from Montrose to the well site. The specialist personnel required to assemble and install the capping stack and operate the debris clearance and subsea dispersal equipment shall be mobilised from WWC resources in Aberdeen and Houston.
		❖ Has the applicant made contingent contractual logistics arrangements to ensure access to suitable marine craft to deploy the Capping Stack and Associated Equipment?	The applicant has stated that a specialist shipbroker shall be contracted to monitor the availability of suitable deployment vessels throughout the drilling of the well. Furthermore in the event that there is not

			free availability of suitable vessels the applicant has contingency proposals to make contact via O&GUK and the IOOA with charterers who have suitable tonnage in order to release such tonnage given the emergency nature of the applicant's requirements.
		❖ Has the Applicant prepared a credible mobilisation and deployment plan, including time required, for the Capping Stack and Associated Equipment and Personnel?	The applicant has developed a credible mobilisation and deployment schedule with in-built contingencies for waiting on weather in order to achieve a three day fair weather window to deploy the capping stack.
		❖ What level of financial responsibility has the Applicant assumed for this element and are details included of how this has been calculated?	The applicant has applied the O&G UK guidelines which proposes an estimate of $40 mill. as the base case and has added a $500,000.- increment to cover additional logistics costs to deploy to the Iolar location. For this report this is equates to a total budget allowance of €35,235,000.-

Summary Report – Capping Stack

Whilst the provisions made by the applicant meet the requirements for a worst case scenario, we have identified a couple of supplementary comments which the applicant may wish to consider as practical issues related to the provision of the capping stack and associated equipment and services;

1. Given the steaming time from Montrose to the well site (between 2 and 3 days) the applicant may wish to consider maintaining subsea dispersal equipment on standby at the shore base in Ireland with the existing marine logistics vessels having the capability to deploy this equipment in order to provide a more immediate dispersal solution in the event of a spill event occurring.

2. In choosing the specialist shipbroker the applicant should consider utilising brokers who have recent previous experience of operating in Irish waters and in particular good working knowledge of the taxation regulations applicable to foreign owners chartering into Irish waters.

2	**Relief Well**	❖ Has the applicant as an integral part of well planning prepared a relief well plan identifying casing design weights grades and quantities required?	The applicant has had a relief well plan created as part of the contractual arrangement with WWC. This relief well planning includes identification of three potential spud locations for the relief well. The actual spud location shall be dependent upon the relative spread of the plume from the blow out on the original well.
		❖ Has the Applicant prepared a minimum rig specification (allowing for the additional pumping and other specialist equipment and consumables storage requirements which may be necessary on that rig) as part of relief well pre-planning to minimise post incident reaction time?	The applicant has identified a listing of the suitable drillships which shall be operating in the North Sea and northern West Africa at the time of drilling the Iolar well. This list shall be updated prior to spud and regularly during the drilling programme to ensure that up to date information is maintained in order to put in place the sub-assignment for one of the most suitable of these drilling units at the time of any re-drill requirement.
		❖ Has the applicant purchased or made contingency contractual arrangements to source in short order the necessary drilling tangibles (normally classed as long lead items)?	The applicant has purchased double the required quantity of casing in order to allow for the requirements of a relief well.
		❖ Has the Applicant prepared a credible conceptual schedule for the delivery of the relief well?	The applicant has prepared a credible conceptual worst case schedule for delivery of the relief well. This includes 28 days for rig mobilisation which incorporates a good degree of contingency as the farthest afield suitable drillship (in Senegal) is 10 days steaming at 10 knots from the well location.
		❖ What level of financial responsibility has the Applicant assumed for this element and are details included of how this has been calculated?	The applicant has utilised the O&G UK Guidelines for Relief Well Planning in order to assess that the Iolar well is deemed a complex well. The applicant has utilised the guidelines to asses that an allowance of 2 times original well AFE requires to be made in order to drill the relief well. For the

			purposes of this report this equates to a Relief Well AFE of €189,155,400.-.

Summary Report –Relief Well

The provisions made by the applicant covering the provision of a relief well in the event of a blow out are sufficient and all in accordance with best industry practice.

3	**Spill Modelling**	❖ Has the Applicant referenced the latest version of the Safety Case and is this the version upon which CER has issued a Safety Permit?	a) In section 2 of the FR, it is noted that submissions have been made to both CER and Irish Coastguard (IRCG) in relation to the Iolar exploration well. b) It is also noted that, in relation to this FR assessment, 'interfacing contractor plans' include the Iolar Well Work Safety Case ECI-OP- STD-0001'.
		❖ Has the applicant provided justification for their choice of model? Is this justification reasonable?	Appendix A (Oil Spill Modelling Overview) notes that the 'OSCAR' model (v 9.0.1) has been utilised. 'OSCAR' is the acronym for the Oil Spill Contingency and Response model which has been developed by the Norwegian Foundation for Scientific Industrial Research (Stiftelsen for Industriell og Teknisk Forskning – SINTEF). SINTEF provides the model for use under license. The various features of the OSCAR model mean that it is an appropriate, and frequently used choice for the modelling of subsea releases from deep-water wells.
		❖ Has the applicant provided justification for the blowout flowrate and fluid properties that are to be modelled? Are these choices reasonable?	a) The planned well is an exploration well and as such the exact blowout flowrate and hydrocarbon properties are unknown. b) Under these circumstances, blowout flowrates could be estimated using recognised reservoir/wellbore modelling software (e.g. PETEX PROSPER model). There is no indication in the FR document that such modelling has taken place. Table A1 (Stochastic model inputs) notes the modelled release rate as 'variable'. c) However, table A1 does provide a total release volume (2,856,856 m^3) and a release duration (146days) from which it is possible to estimate an average release rate of 19,567m3/d or 123,076bopd. This may

		be compared to the 'Catastrophic Event Scenarios during Exploration' used in the BMT Cordah FR Report of 17/Mar/2017 - 100,000bopd. d) In section 4.2 of the FR document (Oil Spill Response & Clean-up Methodology & Calculations) it is noted that the oil spilled in the event of a blowout would have an SG of 0.85 te/m3. In Table A1 (Stochastic Model Inputs) the hydrocarbon properties are noted as ITOPF Category 3. 'Group 3' in the International Tanker Owner Pollution Federation ranking of physical properties reflects a crude oil with generally higher persistence than lighter crudes, meaning that they are likely to lose volume through evaporation more slowly and may be subject to emulsification. e) Two other modelled physical properties are provided: a pour point of 15 Deg. C and a viscosity of 67cp at 15Deg. C. UK modelling guidance (Guidance Notes For Preparing Oil Pollution Emergency Plans - Appendix B; BEIS; December 2016) recommends that wax and asphaltene content parameters should also be utilised.
	❖ Is the modelled duration of blowout consistent with stated capping stack deployment or relief well drilling duration (as appropriate)?	a) A 146-day release was modelled, with the model continuing for a further 30 days after the release had stopped. 146 days is consistent with the total duration for the completion of a relief well. This should be viewed as a very high-end estimate since capping operations are estimated to be completed in 35 days.
	❖ Is the modelled blowout location the same as the wellsite location and has account been taken of whether the blowout is likely to be surface or subsea?	a) Section 1.1 of the FR document (Overview) notes that the proposed well location lies 231km SW of the Irish

		mainland in 2,165m water depth. A map of the well location is also provided (Figure 1.1). b) Table A1 (Stochastic Model Inputs) provides a release location of 50 deg. 53' N; 13deg. 21' E. The longitude appears to be in error (probably a typo) since it is in fact a westerly longitude. If this is indeed a typo then this release location is consistent with Figure 1.1. c) Information In Table A1 (Stochastic Model Inputs) indicates that a seabed release has been modelled as is appropriate for a deep-water blowout.
	❖ Is the stochastic modelling work that has been completed sufficient to identify a reasonable worst-case scenario (e.g. number of runs, duration of runs, oil thickness, output data presentation)?	Information in Appendix A (Oil Spill Modelling Overview) is as follows: a) 110 model runs were carried out across all four seasons. UK guidance (Guidance Notes For Preparing Oil Pollution Emergency Plans - Appendix B; BEIS; December 2016) recommends that a minimum of 100 runs should be performed. b) As described above, a 146-day release was modelled, with the model continuing for a further 30 days after the release had stopped. 146 days is consistent with the total duration of a relief well. This should be viewed as a very high-end estimate since capping operations are estimated to be completed in 35 days. d) It is noted that the worst-case run was chosen as the run that produced the largest amount of shoreline oiling. The information in Table A2 (Stochastic Model Outputs) indicates that this was a run where 23,400 te. of oil was beached. However, Section 4.2 (Oil Spill Clean-up Methodology &

		Calculations) indicates that the worst-case run resulted in 20,190 te. of oil beached. e) The information provided in Table A2 (Stochastic Model Outputs) notes that the 23,400 te. worst-case run occurred in winter. The spring & summer equivalents (when the well is to be drilled) are approximately 4,000 te. The actual worst-case estimate used should therefore be viewed as a very high-end estimate. f) Figures 4.1 to 4.3 of the FR document provides map of sea areas impacted by oil. Oil thickness appears to have been modelled to less than 0.2µm. UK spill modelling guidance requires that oil thickness should be modelled to at least 0.3µm
	❖ Has the applicant provided justification for their choice of metocean data (inc. relevant seasons that are being modelled)? Is this choice reasonable?	Information in Appendix A (Oil Spill Modelling Overview) is as follows: a) Modelling has been carried out in all 4 seasons. b) It is not clear what data period was used. UK spill modelling guidance (Guidance Notes For Preparing Oil Pollution Emergency Plans - Appendix B; BEIS; December 2016) requires using a minimum two-year time series data-set. c) Current data was apparently taken from the Hybrid Coordinate Ocean Model (HYCOM) hind-casts developed by the US-based HYCOM consortium. This is an accepted data source. d) Wind and wave files were apparently based on data from the European Centre for Medium-Range Weather Forecasts (ECMWF). This is an accepted data source.

		❖Are the worst-case scenario deterministic run(s) that have been carried out sufficient to identify all potentially impacted shorelines, environmentally sensitive marine & coastal environments, marine protected areas, including any transboundary impacts (e.g. duration of runs, oil thickness, output data presentation)?	Information in Appendix A (Oil Spill Modelling Overview) is as follows: a) A 146-day release was modelled, with the model continuing for a further 30 days after the release had stopped. 146 days is consistent with the total duration of a relief well. This should be viewed as a very high-end estimate since capping operations are estimated to be completed within 35 days. b) Figures 4.1 to 4.3 provide a graphical representation of fisheries impacts as well as areas of coastline impacted to less than 0.2µm of oil thickness. c) Table A2 (Stochastic Model Outputs) provides information on areas of shoreline and associated protected areas likely to be impacted by a release. These include transboundary impacts. d) Table A3 (Deterministic Modelling - Fate of Oil after 176 days) provides information on the amounts of oil submerged or lost to sediment.
		❖Do the outputs provide information on the volumes of oil or emulsion deposited on the sea bed, stranded and left in the water column?	a) Table A3 (Deterministic Modelling - Fate of Oil after 176 days) provides information on the percentage contribution to: Surface, Atmosphere (Evaporation), Submerged, Sediment, Stranded and Biodegraded.

Summary Report Spill Modelling

Spill modelling work appears to be sufficient to provide a worst-case assessment of the consequences of a blowout. Although there are one or two data gaps (described below) these are unlikely to result in a material change to the conclusions:

1. In relation to this modelling work, the Assessor believes that the Applicant has referenced the latest version of the Safety Case and that this is the version upon which CER has issued a Safety Permit.
2. The Applicant has provided justification for their choice of model. The Assessor believes that this justification is reasonable.

3. Although the applicant has not provided a justification for their choice of blowout flowrate, the flowrate that can be inferred from the data provided is in excess of notional flowrates used in other jurisdictions for wildcat exploration wells.
4. The 146-day modelled duration of blowout is consistent with the time taken to drill a relief well. Since, in practice, it is likely that the well would be brought under control earlier than this (e.g. by deploying a capping stack), this represents a high-end estimate of the amount of oil released.
5. If the quoted release longitude (50deg 53' N; 13deg 21' E) is a typo and the actual longitude modelled is Westerly, then the modelled release location is not materially different to the proposed wellsite location. The decision to model a subsea release is reasonable.
6. Stochastic modelling work has been completed sufficient to identify a reasonable worst-case scenario.
7. The applicant has provided justification for their choice of metocean data. This choice is reasonable. However, no information has been provided on the amount of data used. As an example, UK guidance requires using a minimum two-year time series data-set.
8. The worst-case scenario deterministic run modelling work is sufficient to identify all potentially impacted shorelines, environmentally sensitive marine & coastal environments, marine protected areas, including any transboundary impacts.
9. The model outputs provide sufficient information to identify the fate and associated volumes of oil spilled.

4	**Estimated Cost of Oil Spill Response & Clean-up**	❖ Is the applicant's estimate of cost of response and clean-up either based on accepted models utilised in other jurisdictions (e.g. scoring models) or on direct estimates of response and clean-up costs using the results of relevant deterministic spill modelling?	a) The applicant's estimate of cost of response and clean-up is largely based on the OGUK/OPOL Oil Spill Cost Study of 2012. The results of this study were used to develop a simple algorithm for calculating costs based on the amount of oil spilled. This algorithm was presented to the Irish Offshore Operators Association (IOOA) in May 2017. Based on this algorithm, and in relation to the modelled volume of oil coming ashore (17,161 m3), the estimated cost of clean-up is €134.4m. b) This cost should be viewed as a high-end estimate for 2 reasons: - This estimate is based on a 146-day release. 146 days is consistent with the total duration of a relief well. However, capping operations are estimated to be completed within 35 days. Even where pessimistic estimates are utilised (e.g. Feb'18 Oil & Gas UK Liability Provision Guidelines) release duration is limited to 90 days. - The information provided in Table A2 (Stochastic Model Outputs) notes that the 23,400 te. worst-case run occurred in winter. The spring & summer equivalents (when the well is to be drilled) are approximately 4,000 te. The actual worst-case estimate used should therefore be viewed as a very high-end estimate. c) However, it is also noted that the worst-case run was chosen as the run that produced the largest amount of shoreline oiling. The information in Table A2 (Stochastic Model Outputs) indicates that this was a run where 23,400 te. of oil was beached. However, Section 4.2 (Oil Spill

			Clean-up Methodology & Calculations) indicates that the worst-case run resulted in 20,190te of oil beached.
		❖Are the costs of scientific studies to determine the nature and extent of the environmental impact included (in addition to those required to determine the appropriate spill response)?	a) The applicant has made an assessment of the cost of scientific studies based on a combination of intertidal surveys and offshore surveys (FR document section 4.1). b) Four intertidal survey teams have been assumed at a total cost of €680,000 pa. c) Annual offshore survey costs are based on a 2-week vessel-based survey with associated specialist support and analysis. These are estimated to cost €740,000 pa. d) Total cost of scientific studies assumes that these surveys are required for up to 5 years; i.e. €7.1 million. This is consistent with other estimates of worst case duration of surveys.
		❖If spill modelling identifies potential damage to protected species and habitats (under EU Habitats and Birds Directives), are the costs of studies to determine whether or not reinstatement measures are necessary and feasible included?	a) In Table A2 (Stochastic Model Outputs) the applicant has identified 15 Special Areas of Conservation (SACs) and 2 Special Protected Areas (SPAs) with a probability of oiling which is greater than 40%. These special areas would all appear to be coastal sites. In section 4.1 (Impact Assessment Methodology & Calculations) the applicant notes that most of the shorelines potentially affected are high-energy (rocky shores and cliffs) and so there is likely to be some self-cleaning. b) In Table A3 (Deterministic Modelling - Fate of Oil after 176 days) the applicant notes that 17.1% of oil spilled ends up in the sediment (as opposed to 0.8% stranded). This would appear to suggest that there is the potential for impact on Marine special sites. However, there is no mention of such

			sites in proximity to the well location (e.g. Belgica Mounds Province SAC, Hovland Mound Province SAC, South-West Porcupine Bank SAC, etc).
		❖Are the scientific studies assumed to continue for a reasonable length of time?	a) In section 4.1 (Impact Assessment Methodology & Calculations) the applicant notes that 'a 5-year monitoring plan may be necessary and has been assumed to be the worst-case. A 5 year duration is consistent with UK guidance in relation to spill response planning.
		❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation?	a) The applicant's estimate of cost of response and clean-up is largely based on the OGUK/OPOL Oil Spill Cost Study of 2012. The results of this study were used to develop a simple algorithm for calculating costs based on the amount of oil spilled. This algorithm was presented to the Irish Offshore Operators Association (IOOA) in May 2017.
		❖ Where accepted models have been adapted in order to more closely match the Irish situation, have these modifications been clearly identified and have references been provided in relation to additional sources of information that have been utilised? Are these data sources and associated changes reasonable?	a) The Irish FR spill clean-up algorithm was used unchanged.
		❖ Where direct estimates of response & clean-up costs have been made based on the results of deterministic modelling, has the applicant clearly defined the additional data sources that have been utilised (e.g. clean-up cost data, waste disposal data)? Is this data reasonable?	a) The applicant has not based the costs based on direct estimates.

Summary Report Oil Spill Response and Clean-up

The applicant's estimates of worst-case cost of oil spill response, clean-up and associated scientific studies (€141.1 million) is reasonable. Although there are some cost elements that may have been under-estimated, these are likely to be offset by the over-estimate of volume of oil spilled:

1. As described above, the spill duration is based on the time to drill a relief well; the well is likely to be under control well before that amount of time has passed. Moreover, the worst-case run appears to be a winter run. The spring & summer equivalents (when the well is to be drilled) result in significantly smaller geographical spread and smaller quantities of oil beached.
2. However, there are small differences quoted for the amount of oil beached. The information in Table A2 (Stochastic Model Outputs) indicates that 23,400 te. of oil was beached. However, Section 4.2 (Oil Spill Clean-up Methodology & Calculations) indicates that the worst-case run resulted in 20,190 te. of oil beached.
3. It may be that impacts on marine special sites may have been under-estimated. The applicant notes that 17.1% of oil spilled ends up in the sediment (as opposed to 0.8% stranded). This would appear to suggest that there is the potential for impact on Marine special sites. However, there is no mention of such sites in proximity to the well location (e.g. Belgica Mounds Province SAC, Hovland Mound Province SAC, South-West Porcupine Bank SAC, etc.).

5	**Estimated Cost of Impacts on Fisheries & Aquaculture**	❖ Is the applicant's estimate of potential fisheries & aquaculture impact costs based on accepted models utilised in other jurisdictions (e.g. scoring models) or on direct estimates using the results of relevant deterministic spill modelling?	a) The methodology for calculating the impacts on fisheries is described in section 4.3 of the FR document. This is based on an approach taken by BMT Cordah in 2017 for updating UKCS FR estimates (Financial Responsibility for Oil Spill Clean-up; BMT Cordah; A_O&G_012; March 2017). In summary, the total sea-surface area impacted by spilled oil was exported from OSCAR to a GIS database. International Council for the Exploration of the Sea (ICES) fish landing data were over-layed onto this database. The value of each block transited by oil was then calculated for demersal, pelagic and shellfish fisheries. Impact costs were then calculated on the basis of a 6-month closure of demersal & pelagic fisheries and a 1-year closure for shellfish. Note that Irish FR guidance recommends assuming a 3-month closure, consequently the applicant's estimate can be assumed to be a high-end estimate. b) The methodology for calculating the impacts on aquaculture is described in section 4.4 of the FR document and is based on recommendations within Irish FR guidance. Information regarding impacted shorelines was exported from OSCAR to a GIS database and compared to the 2017 total value of aquaculture figures provided by the Irish Seafood Development Agency (BIM).
		❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation?	a) The use of the 2017 BMT Cordah fisheries methodology is reasonable since it uses data specific to the sea areas impacted by oil; and also uses a longer estimate of

		fisheries closure than that recommended in Irish guidance. b) The aquaculture methodology is in line with Irish FR guidance.
	❖ Where accepted models have been adapted in order to more closely match the Irish situation, have these modifications been clearly identified and have references been provided in relation to any additional sources of information that have been utilised? Are these data sources and associated changes reasonable?	The only adaptation made by the applicant is the assumption of a 6-month fisheries closure as opposed to the 3-month closure recommended in Irish FR guidance.
	❖ Where direct estimates of potential fisheries & aquaculture impact costs have been made based on the results of deterministic modelling, has the applicant clearly defined the impact data sources that have been utilised (e.g. value of fish landings, aquaculture value for each potentially impacted county)? Is this data comprehensive and reasonable?	a) The value of fisheries impacted by spillage was taken from the Scottish Government Fishing Effort and Quantity & Value of Landings by ICES Rectangle database. The relevant value of landings was averaged over the period 2012-2016. In Figures 4.1 to 4.3 of the FR document, for each of the 3 types of fisheries, the applicant provides maps showing, on the one hand maximum surface oil thickness (to a minimum of less than 0.2µm), and on the other ICES values for landings. On a qualitative basis, the eventual tabulation of values seems consistent with the information provided in these maps. b) Aquaculture estimates are noted as being based on the BIM (Irish Seafood Development Agency) 2018 aquaculture survey. However, the individual county values provided in Table 4.4 of the FR document are not consistent with the values in the 2018 BIM report. The total

			value would appear to €181.2m as opposed to the €143.0m figure quoted.

Summary Report Cost of Impacts on Fisheries & Aquaculture

The applicants estimate of worst-case cost of impacts on fisheries and aquaculture (€188.8 million) is reasonable. Although discrepancies have been identified in relation to cost of aquaculture impacts, these are not likely to be material to the overall conclusion:

1. The fisheries impact is based on the extent of the sea surface impacted by spilled oil. Since, as described above, the amount of oil spilled is a high-end estimate, it is likely that the cost of fisheries impact is likely to be high-end too.
2. The applicant has also assumed a 6-month fisheries closure as opposed to the 3-month closure recommended in Irish FR guidance.
3. Aquaculture impact estimates are based on the BIM (Irish Seafood Development Agency) 2018 aquaculture survey. However, the individual county values provided in Table 4.4 of the FR document are not consistent with the values in the 2018 BIM report. The total value would appear to €181.2m as opposed to the €143.0m figure quoted.

6	**Estimated Cost of other economic impacts**	❖ Has the applicant considered other economic impacts that may be the subject of legitimate third party claims?	a) The applicant has considered other economic impacts. Tourism, coastal power stations, agriculture and ferries & ports have all been considered (section 4.5 of the FR document). b) Impacts on coastal power stations and renewable energy sites are viewed as negligible since the minimum spill arrival time in both instances is greater than 30 days, and levels of oiling are likely to be limited to 'sheen' thus providing time to deploy effective protective measures as part of the spill response. This is a reasonable assumption. c) Similar arguments are used to discount material impacts in relation to agriculture, ports and ferries. d) Tourism impacts have been estimated (see below).
		❖ Where direct estimates of potential impact costs have been made based on the results of deterministic modelling, has the applicant clearly defined the impact data sources that have been utilised	a) Section 4.5.1 of the FR document (Tourism) notes that tourism revenues are provided which are stated to be averages over the period 2014-2016 using data from Failte Ireland. Although a web reference has been provided this goes to a generic site and it therefore has not been possible to directly confirm the figures used. However, the €2.55bn estimate is consistent (and slightly higher than) the €2.0bn order-of-magnitude figure provided in the Irish FR guidelines.

		❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation?	Within section 4.5.1 (Tourism) the total tourism figure (€2.55bn) figure had been reduced to €255.2m (10% of the full figure) based on the tourism methodology used by BMT Cordah (Financial Responsibility for Oil Spill Clean-up; BMT Cordah; A_O&G_012; March 2017). This is noted in the BMT Cordah report as being a mechanism for accounting only for a loss in direct tourism revenue. A similar discount is suggested in the Irish FR guidance - in this case it is offered as a mechanism for estimating coastal tourism revenues as opposed to county-wide figures.

Summary Report Cost of other economic impacts

The applicant's estimate of worst-case cost of other economic impacts (€255.2 million) is reasonable.

1. Of all the potential additional economic impacts of oil spillage, the applicant believes that only tourism impacts are likely to be material - this is a reasonable conclusion.
2. Potential tourism impacts are difficult to quantify. However, the applicant has based their assessment on Irish guidance and guidance also in place in the UK.

7	**Financial Responsibility (FR) Cost Estimate**	❖ Has the applicant provided an overall FR cost estimate which is consistent with the sum of all the various elements described above? ❖ Where any concerns or reservations have been identified in the course of this assessment (as documented above), the assessor should document their view regarding whether or not these concerns or reservations could be material to the overall FR figure. ❖ The assessor should state whether or not the applicant's total FR estimate is reasonable. In the event that the assessor believes that FR should materially increase then then this conclusion should be clearly documented.	a) The overall FR cost estimate (€809.49 million) is consistent with the sum of all the elements described above. b) A small number of concerns have been raised about the basis of this estimate; these are described in the various sections above. However, none of these concerns are material to the overall FR figure, given that the volumes of oil spilled are high-end estimates. c) On this basis the applicants total FR estimate is reasonable

Summary Report - Overall Financial Responsibility (FR) Cost Estimate

The applicant's overall FR estimate (€809.49 million) is reasonable. A small number of concerns have been raised about the basis of this estimate. However, none of these concerns are material to the overall FR figure, given that the volumes of oil spilled are high-end estimates.

Iolar Well Financial Responsibility Assessment

B. INSURANCE Protocol Checklist (Nexen/CNOOC documentation)

No	*Protocol Element*		*Observations & Recommendations (Initial Review @ 11 February 2019)*	*Observations & Recommendations (Updated @ 04 March 2019)*	*Observations & Recommendations (Updated @ 13 March 2019)*
1	What method is being used to demonstrate financial responsibility?	❖ Insurance ❖Self-Insurance - Audited Financial Statements & Credit Rating.	Insurance is being used to demonstrate financial responsibility by the following documents supplied by Nexen Petroleum UK Limited and/or their parent CNOOC International Ltd	Additional Evidence of Insurance including Third Party Liability Insurance has been provided in the form of signed certification of insurance from Willis Towers Watson	
		❖Letter of Credit from a Financial institution approved by DCCAE	Policy No. IR63650M: Covering Property and Operators Extra Expense for a limit of USD 400,000,000. The policy expires 31 December 2019.		
		❖Bank Letter of Guarantee with DCCAE noted as beneficiary	Policy No. UK63700M: Covering Excess Property and Operators Extra Expense for a limit of USD 125,000,000 excess of USD 400,000,000. The policy expires 31 December 2019.		
		❖ Indemnity Bond or other surety with funds payable on demand	Verification of Insurance FR-1 for Offshore Pollution Liability Agreement (OPOL) responsibility for a limit of USD 250,000,000 per incident/USD 500,000,000 in the annual aggregate. The certificate expires 31 December 2019.		

		❖Any other form that is satisfactory to the Regulator.	Although CNOOC advised DCCAE that their worldwide Third Party Liability insurance totals USD 1,000,000,000 (ref email 29 January 2019 Michelle Ball to Louise Casey), this has not been evidenced. ACTION: Evidence of Third Party Liability Insurance is required.		
2	Has an evidence of insurance, signed by broker or insurers been provided?		The Evidences of Insurance are issued by ICM Assurance Ltd, the captive insurance company of CNOOC, the parent company of the Applicant. The reinsurance security is provided by Oil Insurance Limited (OIL) of Bermuda for USD 400,000,000 and above this, by Chrysalis, a facility written by 3 Lloyds of London syndicates for a limit of USD 125,000,000. The Verification of Insurance FR-1 for OPOL has been signed by OIL.	Additional Evidence of Insurance including Third Party Liability Insurance has been provided in the form of signed certification of insurance from Willis Towers Watson	
3	Do the limits specified in the insurance documentation meet the amount of FR required following the modelling stage? *{Note NRG assessment = EUR 809.49 million see review 06 feb 2019]*		It is unclear if the Limits are for "100%" or "for interest". The standard premise is that limits are for 100% unless otherwise stated. We are aware that OIL and Chrysalis limits are usually for interest; if so, then the total of USD 525,000,000 for interest, equates to USD 1,050,000,00 on a 100% basis. HOWEVER, this amount does not include the necessary Third Party Liability insurance which has not been evidenced. ACTION: The policies should be endorsed to clarify if the Limits are "100%" or "for interest"	1. The newly supplied Third Party Liability Evidence of Insurance shows a limit of USD 362,500,000 (for interest) which equates to USD 725,000,000 (for 100%). 2. We are unable to locate evidence to confirm if the limits for the previously provided Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) are for 100% or Insured's interest. ACTION: The minimum limit total is USD 1,250,000,000 (100%) - being USD 725,000,000 + USD 525,000,000 which is sufficient for this review. HOWEVER, For the sake of good order, the Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M)	Certification has been supplied which has been signed by ICM Assurance and dated January 23 2019. This confirms the policy limits for the Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) are for Insured's interest. Accordingly the total evidenced limit for Operators Extra Expense is USD 1,050,000,000 (100%) which, when added to the Third Party Limit of USD 725,000,000 (100%), provides a combined total of USD

				should be endorsed to clarify if the Limits are "100%" or "for interest"	1,775,000,000 (100%). No further action is required.
4	Is the insurer security adequate?	Minimum "A-" Standard and Poor's (or equivalent) is required. If unrated captive insurer is put forward, reinsurance security needs to meet "A-".	OIL, Bermuda carries a 'A' rating from Standard & Poor's which is acceptable. Chrysalis is written by Lloyd's which carries a 'A+' rating which is acceptable.	The newly supplied Third Party Liability Evidence of Insurance is satisfactory, confirming that the Insurers or their Reinsurers have at least an "A-" rating.	
5	What insurance coverage is being provided?	❖ Operators Extra Expense Insurance, including	YES	No further action required	
		- Control of Well Insurance	YES		
		- Seepage & Pollution, Clean-up & Contamination	YES		
		- Redrilling/Extra Expense Insurance	YES		
		❖ Third Party Liability Insurance	Not Provided. ACTION: Evidence of Third Party Liability Insurance is required.	Third Party Liability Evidence of Insurance has been provided.	
		❖ OPOL insurance, as applicable (if applicant is OPOL member)	YES	No further action required	
6	Are "standard" market forms and extensions being used?		OIL & Chrysalis have standard acceptable forms.	No further action required	
7	Are the territorial limits of the policy appropriate?		Yes	No further action required	

8	Does Third Party Liability policy wording include coverage for fines, penalties, punitive damages etc.?	The Third Party Liability Policy has not been provided. ACTION: Evidence of Third Party Liability Insurance is required.	An Evidence for Third Party Liability insurance has been provided which is silent as respects coverage for fines, penalties, punitive damages etc. Whilst this aspect is checked in the Protocol Checklist as a derisible item, it is not currently available from the commercial insurance market. Accordingly, no further action is required.	
9	Does the Third Party Liability policy wording have the exclusion for costs arising from well control etc. deleted?	The Third Party Liability Policy has not been provided. ACTION: Evidence of Third Party Liability Insurance is required.	The newly supplied Third Party Liability Evidence of Insurance is compliant	
10	Are DCCAE named as Co-Insured?	No. ACTION: The policy/ies need to be endorsed accordingly	The Third Party Liability Evidence of Insurance is compliant; HOWEVER we have not seen evidence that previously provided Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) have been endorsed as required. ACTION: The Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) should be endorsed to name DCCAE as Co-Insured.	Certification has been supplied which has been signed by ICM Assurance and dated January 23 2019. This confirms DCCAE have been added as an additional Insured. This is acceptable and therefore no further action is required.
11	Is there a Waiver of Subrogation in favour of DCCAE?	No. ACTION: The policy/ies need to be endorsed accordingly	The Third Party Liability Evidence of Insurance is compliant; HOWEVER we have not seen evidence that previously provided Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) have been endorsed as required. ACTION: The Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) should be endorsed to provide a Waiver of Subrogation in favour of DCCAE.	Certification has been supplied which has been signed by ICM Assurance and dated January 23 2019. This confirms DCCAE are provided with a waiver of subrogation. This is acceptable and therefore no further action is required.
12	Are the Cancellation Conditions "standard"?	The OIL & Chrysalis have standard cancellation conditions which are acceptable.	The Third Party Liability Evidence of Insurance is compliant.	

13	Has provision for insurers to "pay on behalf" of the insured been included in the Applicants Extra Expense policy?	This provision is not provided by the OIL policy wording, however we do not believe this to be a significant issue in this instance.	No further action required	
14	Has evidence of OPOL membership been provided? If so, is the coverage specified in the supporting documentation?	YES.	No further action required	
SUMMARY (11 February 2019) : The highlighted items need to be addressed. Evidence of Third Party Liability Insurance is required since although the OIL/Chrysalis policy provides an element of pollution coverage, this could be eroded by the cost of bringing the well under control. Further, the coverage is predominantly of a "first party" nature. The adequacy of the evidenced limits can only be established once Action Points have been addressed by the applicant.				
SUMMARY (04 March 2019) : The highlighted items (in bright yellow) need to be addressed. Although the newly provided Evidence of Third Party Liability Insurance is acceptable, some comments relating to the previously provided Property and Operators Extra Expense Policies (Policy Nos. IR63650M & UK63700M) have apparently been overlooked.				
SUMMARY (13 March 2019) : Following the provision of appropriate evidences of insurance, the application from CNOOC/Nexen is now compliant.				

INDECS 04 March 2019 ***INDECS 13 March 2019***

B. INSURANCE Protocol Checklist (Exxon documentation)

No	Protocol Element		Observations & Recommendations (Initial Review @ 11 February 2019)	Observations & Recommendations (Updated @ 21 March 2019)
1	What method is being used to demonstrate financial responsibility?	❖ Insurance ❖Self-Insurance - Audited Financial Statements & Credit Rating. ❖Letter of Credit from a Financial institution approved by DCCAE ❖Bank Letter of Guarantee with DCCAE noted as beneficiary ❖ Indemnity Bond or other surety with funds payable on demand ❖Any other form that is satisfactory to the Regulator.	Insurance is being used to demonstrate financial responsibility by the following documents supplied by ExxonMobil Exploration and Production Ireland (Offshore South) Limited: Insurance Certificate ART-5563-L1: Covering (i) Property and Operators Extra Expense for a limit of USD 200,000,000 for interest in the aggregate, and (ii) Third Party Liability Insurance for a limit of USD 300,000,000 in the aggregate. The coverage expires 31 December 2019.	An additional Insurance Certificate has been supplied. This is issued by Allianz Risk Transfer AG and is signed 18 March 2019. The Certificate confirms the coverages under Policy Nos. ART-5563-LI and ART-5564-LI and is effective from 29 January 2019 until 31 December 2019
2	Has an evidence of insurance, signed by broker or insurers been provided?		The Evidence of Insurance has been issued by Allianz and is reinsured by Ancon (the captive insurance company of ExxonMobil).	

3	Do the limits specified in the insurance documentation meet the amount of FR required following the modelling stage? *{Note NRG assessment = EUR 809.49 million see review 06 feb 2019]*		It is unclear if the Third Party Liability Limits are for "100%" or "for interest". Further, the limits for both Operators Extra Expense and Third Party Liabilities are both aggregated, meaning the limit could be eroded by losses unassociated with the drilling of the well in question. **ACTION: (1) The policies should be endorsed to clarify if the Third Party Liability Limits are "100%" or "for interest". (2) The limits should be restated to remove any element of aggregation, unless qualified to relate to the well drilling operation in question.**	Certification has been supplied which has been signed by Allianz and 18 March 2019. This confirms the policy limits for the Property and Operators Extra Expense Policies (Policy Nos. Policy Nos. ART-5563-LI and ART-5564-LI) are for Insured's interest [***See Action (1) 11 February 2019***] Accordingly the total evidenced limit for Operators Extra Expense is USD 400,000,000 (100%) which, when added to the Third Party Limit of USD 700,000,000 (100%), provides a combined total of USD 1,700,000,000 (100%). Further, the limits are no longer aggregated [***See Action (2) 11 February 2019***]. No further action is required.
4	Is the insurer security adequate?	Minimum "A-" Standard and Poor's (or equivalent) is required. If unrated captive insurer is put forward, reinsurance security needs to meet "A-".	The policy/ies are written by Allianz in the first instance who carry rating of 'AA' from Standard and Poor's. Accordingly, the insurer security is adequate.	
5	What insurance coverage is being provided?	❖ Operators Extra Expense Insurance, including - Control of Well Insurance - Seepage & Pollution, Clean-up & Contamination - Redrilling/Extra Expense Insurance ❖ Third Party Liability Insurance ❖ OPOL insurance, as applicable (if applicant is OPOL member)	YES YES YES YES YES NO. ExxonMobil Exploration and Production Ireland (Offshore South) Limited is not a party to OPOL.	No further action required
6	Are "standard" market forms and extensions being used?		The conditions are acceptable	No further action required

7	Are the territorial limits of the policy appropriate?	YES	No further action required
8	Does Third Party Liability policy wording include coverage for fines, penalties, punitive damages etc.?	It is unclear if this has been met**. ACTION: Evidence is required by way of a signed endorsement or amendment.**	An Evidence for Third Party Liability insurance has been provided which is silent as respects coverage for fines, penalties, punitive damages etc. Whilst this aspect is checked in the Protocol Checklist as a derisible item, it is not currently available from the commercial insurance market. Accordingly, no further action is required.
9	Does the Third Party Liability policy wording have the exclusion for costs arising from well control etc. deleted?	YES	No further action required
10	Are DCCAE named as Co-Insured?	YES	No further action required
11	Is there a Waiver of Subrogation in favour of DCCAE?	YES	No further action required
12	Are the Cancellation Conditions "standard"?	The cancellation conditions are acceptable	No further action required
13	Has provision for insurers to "pay on behalf" of the insured been included in the Applicants Extra Expense policy?	It is unclear if this provision has been met, however we do not believe this to be a significant issue in this instance.	No further action required
14	Has evidence of OPOL membership been provided? If so, is the coverage specified in the supporting documentation?	ExxonMobil Exploration and Production Ireland (Offshore South) Limited is not a party to OPOL.	No further action required
SUMMARY (11 February 2019): The highlighted items need to be addressed. Depending on the response to the Action Points in Item 3, the evidenced limits may be insufficient given the quantum of the FR modelling requirement.			
SUMMARY (21 March 2019): Following the provision of appropriate evidences of insurance, the application from ExxonMobil is now compliant.			

INDECS 11 February 2019 **INDECS 21 March 2019**

APPENDIX 2 Glossary of Abbreviations and Acronyms

AA	**Appropriate Assessment (under Habitats Directive)**
AFE	**Authorisation for Expenditure**
ALARP	**As Low As Reasonably Practicable**
APPEA	**Australian Petroleum Production & Exploration Association**
BAOAC	**Bonn Agreement Oil Appearance Code**
BEIS	**Dept for Business, Energy and Industrial Strategy, formerly DECC, (UK)**
BIM	**Bord Iascaigh Mhara**
BORP	**Blow-out relief plan**
CAD	**Canadian Dollar**
CER	**Commission for Energy Regulation**
COGOA	**Canada Oil and Gas Operations Act**
CPRA	**Canada Petroleum Resources Act**
C-NLAAIA	**Canada-Newfoundland and Labrador Atlantic Accord Implementation Act**
C-NLAAINLA	**Canada-Newfoundland and Labrador Atlantic Accord Implementation Newfoundland and Labrador Act**
CNOSPRAIA	**Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act**
CNSOPRAI(NS)A	**Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation (Nova Scotia) Act**
C-NLOPB	**Canada-Newfoundland and Labrador Offshore Petroleum Board - www.cnlopb.ca**
CNSOPB	**Canada-Nova Scotia Offshore Petroleum Board - www.cnsopb.ns.ca**
NEB	**National Energy Board**
CIL	**Commissioners of Irish Lights**
COW	**Control of Well**
CPUE	**Catch per unit effort**
CRU	**Commission for Regulation of Utilities formerly CER**

CV	**Curriculum Vitae**
DCCAE	**Department of Communications, Climate Action and Environment formerly DCENR**
DCENR	**now DCCAE**
DECC	**Department of Energy & Climate Change (UK)**
DKK	**Danish Kroner**
EEA	**European Economic Area**
EEZ	**Exclusive Economic Zone**
EC	**European Council**
EIA	**Environmental Impact Assessment**
ELD	**Environmental Liability Directive**
EP	**Environmental Plan**
ERP	**Emergency Response Plan**
EU	**European Union**
FEL	**Frontier Exploration Licence**
FPSO	**Floating Production Storage and Offloading unit**
FR	**Financial Responsibility**
HSA	**Health and Safety Authority**
HSE	**Health & Safety Executive (UK)**
IAA	**Irish Aviation Authority**
IADC	**International Association of Drilling Contractors**
ICES	**International Council for Exploration of the Sea**
IOOA	**Irish Offshore Operators Association**
IOPCF	**International Oil Pollution Compensation Fund**
IRCG	**Irish Coast Guard**
IRR	**Insurance Risk Review**
ITOPF	**International Tanker Owners Pollution Federation Limited**
IWCF	**International Well Control Forum**

JOA	**Joint Operating Agreement**
MEI	**Major Environmental Incident**
MODU	**Mobile Offshore Drilling Unit**
MPE	**Ministry of Petroleum and Energy**
MRC	**Marine Rescue Centre**
MSFD	**Marine Strategy Framework Directive**
MSO	**Marine Survey Office**
NE	**North East**
NOPSEMA	**National Offshore Petroleum Safety and Environment Management Authority**
NRD	**Natural Resource Damage**
NRDA	**Natural Resource Damage Assessment**
OD	**Norwegian Petroleum Directorate**
OGA	**Oil & Gas Authority (UK)**
OGUK	**Oil & Gas UK (formerly UK Offshore Applicants Association)**
OILMAP	**Oil Spill Model and Response System**
OPEP	**Oil Pollution Emergency Plan**
OPGGS	**Offshore Petroleum and Greenhouse Gas Storage Act 2006**
OPOL	**Offshore Pollution Liability Association Ltd**
ORP	**Office of Radiological Protection**
OSCAR	**Oil Spill Contingency and Response model**
OSCP	**Oil Spill Contingency Plan**
OSIS	**Oil Spill Information System**
OSPAR	**Convention for the Protection of the Marine Environment of the North East Atlantic**
OSPRAG	**Oil Spill Prevention and Response Advisory Group**
OSRL	**Oil Spill Response Limited**
PEES	**Irish Petroleum (Exploration and Extraction) Safety Act 2015**

PU	**Petroleum Undertaking**
PUDAC	**Permit to Use and Discharge Added Chemicals**
SC	**Safety Case**
SCAT	**Shoreline Cleanup Assessment Team**
STECF	**Scientific, Technical and Economic Committee for Fisheries**
TPL	**Third Party Liability**
UKCS	**UK Continental Shelf**
USD	**US Dollars**
WellEx	**Well Examination**

APPENDIX 3 ASSESSMENT PROTOCOLS

FINANCIAL RESPONSIBILITY - ASSESSMENT PROTOCOL

A. TECHNICAL & SPILL COST

No	*Protocol Element*		*Observations & Recommendations*
1	**Capping Stack**	❖ Has the applicant made contractual arrangements guaranteeing access to suitable capping stack equipment? ❖ Has the applicant made contractual arrangements for the deployment of the capping stack, associated debris clearance and subsea dispersal equipment and suitably qualified personnel to ensure optimal utilisation of this equipment? ❖ Has the applicant made contingent contractual logistics arrangements to ensure access to suitable marine craft to deploy the Capping Stack and Associated Equipment? ❖ Has the Applicant prepared a credible mobilisation and deployment plan, including time required, for the Capping Stack and Associated Equipment and Personnel? ❖ What level of financial responsibility has the Applicant assumed for this element and are details included of how this has been calculated?	

2	**Relief Well**	❖ Has the applicant as an integral part of well planning prepared a relief well plan identifying casing design weights grades and quantities required? ❖ Has the Applicant prepared a minimum rig specification (allowing for the additional pumping and other specialist equipment and consumables storage requirements which may be necessary on that rig) as part of relief well pre-planning to minimise post incident reaction time? ❖ Has the applicant purchased or made contingency contractual arrangements to source in short order the necessary drilling tangibles (normally classed as long lead items)? ❖ Has the Applicant prepared a credible conceptual schedule for the delivery of the relief well? ❖ What level of financial responsibility has the Applicant assumed for this element and are details included of how this has been calculated?	

3	**Spill Modelling**	❖ Has the Applicant referenced the latest version of the Safety Case and is this the version upon which CER has issued a Safety Permit? ❖ Has the applicant provided justification for their choice of model? Is this justification reasonable? ❖ Has the applicant provided justification for the blowout flowrate and fluid properties that are to be modelled? Are these choices reasonable ? ❖ Is the modelled duration of blowout consistent with stated capping stack deployment or relief well drilling duration (as appropriate)? ❖ Is the modelled blowout location the same as the wellsite location and has account been taken of whether the blowout is likely to be surface or subsea? ❖ Is the stochastic modelling work that has been completed sufficient to identify a reasonable worst-case scenario (e.g. number of runs, duration of runs, oil thickness, output data presentation)? ❖ Has the applicant provided justification for their choice of metocean data (inc. relevant seasons that are being modelled)? Is this choice reasonable ? ❖Are the worst-case scenario deterministic run(s) that have been carried out sufficient to identify all potentially impacted shorelines, environmentally sensitive marine & coastal environments, marine protected areas, including any transboundary impacts (e.g. duration of runs, oil thickness, output data presentation)? ❖Do the outputs provide information on the volumes of oil or emulsion deposited on the sea bed, stranded and left in the water column?	

4	**Estimated Cost of Oil Spill Response & Clean-up**	❖Are the costs of scientific studies to determine the nature and extent of the environmental impact included (in addition to those required to determine the appropriate spill response)? ❖If spill modelling identifies potential damage to protected species and habitats (under EU Habitats and Birds Directives), are the costs of studies to determine whether or not reinstatement measures are necessary and feasible included? ❖Are the scientific studies assumed to continue for a reasonable length of time? ❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation? ❖ Where accepted models have been adapted in order to more closely match the Irish situation, have these modifications been clearly identified and have references been provided in relation to additional sources of information that have been utilised? Are these data sources and associated changes reasonable? ❖ Where direct estimates of response & clean-up costs have been made based on the results of deterministic modelling, has the applicant clearly defined the additional data sources that have been utilised (eg clean-up cost data, waste disposal data)? Is this data reasonable?	

5	**Estimated Cost of Impacts on Fisheries & Aquaculture**	❖ Is the applicant's estimate of potential fisheries & aquaculture impact costs based on accepted models utilised in other jurisdictions (e.g. scoring models) or on direct estimates using the results of relevant deterministic spill modelling? ❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation? ❖ Where accepted models have been adapted in order to more closely match the Irish situation, have these modifications been clearly identified and have references been provided in relation to any additional sources of information that have been utilised? Are these data sources and associated changes reasonable? ❖ Where direct estimates of potential fisheries & aquaculture impact costs have been made based on the results of deterministic modelling, has the applicant clearly defined the impact data sources that have been utilised (e.g. value of fish landings, aquaculture value for each potentially impacted county)? Is this data comprehensive and reasonable?	
6	**Estimated Cost of other economic impacts**	❖ Has the applicant considered other economic impacts that may be the subject of legitimate third party claims? ❖ Where direct estimates of potential impact costs have been made based on the results of deterministic modelling, has the applicant clearly defined the impact data sources that have been utilised ❖ Where accepted models from other jurisdictions have been used, has the applicant justified why these models are applicable to the relevant Irish situation?	

7	**Financial Responsibility (FR) Cost Estimate**	❖ Has the applicant provided an overall FR cost estimate which is consistent with the sum of all the various elements described above? ❖ Where any concerns or reservations have been identified in the course of this assessment (as documented above), the assessor should document their view regarding whether or not these concerns or reservations could be material to the overall FR figure. ❖ The assessor should state whether or not the applicant's total FR estimate is reasonable. In the event that the assessor believes that FR should materially increase then then this conclusion should be clearly documented.	

B. INSURANCE

No	Protocol Element		Observations & Recommendations
1	What method is being used to demonstrate financial responsibility?	❖ Insurance ❖Self-Insurance - Audited Financial Statements & Credit Rating. ❖Letter of Credit from a Financial institution approved by DCCAE ❖Bank Letter of Guarantee with DCCAE noted as beneficiary ❖ Indemnity Bond or other surety with funds payable on demand ❖Any other form that is satisfactory to the Regulator.	
2	Has an evidence of insurance, signed by broker or insurers been provided?		
3	Do the limits specified in the insurance documentation meet the amount of FR required following the modelling stage?		
4	Is the insurer security adequate?	Minimum "A-" Standard and Poor's (or equivalent) is required. If unrated captive insurer is put forward, reinsurance security needs to meet "A-".	
5	What insurance coverage is being provided?	❖ Applicants Extra Expense Insurance, including - Contol of Well Insurance - Seepage & Pollution, Cleanup & Contamination - Redrilling/Extra Expense Insurance ❖ Third Party Liability Insurance ❖ OPOL insurance, as applicable (if applicant is OPOL member)	

6	Are "standard" market forms and extensions being used?	
7	Are the territoral limits of the policy appropriate?	
8	Does Third Party Liability policy wording include coverage for fines, penalties, punitive damages etc.?	
9	Does the Third Party Liability policy wording have the exclusion for costs arising from well control etc. deleted?	
10	Are DCCAE named as Co-Insured?	
11	Is there a Waiver of Subrogation in favour of DCCAE?	
12	Are the Cancellation Conditions "standard"?	
13	Has provision for insurers to "pay on behalf" of the insured been included in the Applicants Extra Expense policy?	
14	Has evidence of OPOL membership been provided? If so, is the coverage specified in the supporting documentation?	