

ADURA

Jackdaw
PRA/357

Chemical Risk Assessment

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09/07/2026	CP/TBC	Initial submission of the chemical permit for production operations as Adura. For previous iterations of this document, refer to existing Chemical Permit Ref: CP/3776/1.

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Cautionary Statement

Disclosure - We respectfully request you to promptly inform and consult with us in the event that this document is the subject of, or forms part of, a request under the Freedom of information Act 2000 and/or the Environmental Information Regulations 2004.

Adura Operations Limited confirms that no hydrocarbons will be extracted or produced from the Jackdaw field in connection with this PRA/357 until such time as (i) OPRED has agreed to the grant of consent by the OGA for the Jackdaw Project; and (ii) the OGA has granted consent for the Jackdaw Project, both decisions having been made under the Offshore Oil and Gas Exploration, Production, Unloading and Storage (Environmental Impact Assessment) Regulations 2020.

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Chemical Risk Assessment**1. CHEMICAL RISK ASSESSMENT****1.1. CHARM CALCULATIONS AND ASSUMPTIONS****1.1.1. PRODUCTION CHEMICALS**

Year	Oil Production (m ³ /day)	Condensate Production (m ³ /day)	Gas Production (1000 m ³ /day)	Produced Water Total Volume (m ³ /day)	Produced Water discharge volume (m ³ /day)	Produced Water Re-Injected Volume (m ³ /day)
2026	0	512	2,064	0	0	0
2027	0	1,179	4,853	103	0	0
2028	0	1,079	4,813	398	0	0

Adura will continually monitor the field performance from all Jackdaw wells and if required, the forecast will be revisited each year. The figures provided for in this application represent a maximum case forecast in terms of volume.

1.1.2. PRODUCTION AND PROCESS CHEMICALS

All chemicals specified for use on the Jackdaw platform and on this application are registered with Cefas as per standard Adura procedures. The most up to date Cefas ranked list was used to source templates in order to complete this chemical permit application. Adura will continue to liaise with the chemical suppliers to ensure that the chemicals will be re-registered or will be submitted for re-registration at the appropriate time (generally 8-weeks prior to the expiry date).

No discharge of production chemicals will take place at Jackdaw. The produced fluids will be processed and discharged at Shearwater. Therefore, these chemicals have been assigned a "ZEX" discharge code and a CHARM calculation would not be applicable.

1.1.3. WATER INJECTION CHEMICALS

Not currently applicable.

1.1.4. UTILITY CHEMICALS

For detergents and cleaning fluids discharged via the open hazardous and open non-hazardous drains, the CWS algorithm has been used for the risk assessment.

For discharge via the process system the estimated batch tonnage used is converted into a discharge dosage in the applicable daily fluid volume. However, no discharge through the process will occur at Jackdaw. All Jackdaw produced fluids will be processed and discharged at Shearwater. Therefore, these chemicals have been assigned a "ZEX" discharge code and a CHARM calculation would not be applicable.

A synthetic hydrocarbon based hydraulic control fluid, Castrol Brayco Micronic SV/4, is used within the hydraulic system on the Jackdaw WHP. Under normal circumstances the product will not be discharged. Therefore, this chemical have been assigned a "ZSS" discharge code and a CHARM calculation would not be applicable.

1.1.5. BATCH DILUTION FACTORS

A batch dilution factor is a ratio that shows how much of the original solution is left after dilution.

Batch dilution factors are calculated from:

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- The density of the discharged fluid, normally equivalent to seawater, not the density of the product.
- The discharge rate of the discharged fluid.
- The total volume of fluid discharged.

If the discharge parameters exceed the permitted range in EOSCA, the worst-case BDF of 0.001 will be used for consistency of CHARM modelling. This will generate a slightly higher RQ than using the EOSCA maximum values which generate a BDF of 9.95×10^{-4} .

If the discharge parameters are below the permitted range in CHARM, the minimum values (density of discharged fluid = 1.03 g/cm^3 , volume = 3 m^3 and discharge rate = $60 \text{ m}^3/\text{hour}$) have been used to calculate a BDF of 1.79×10^{-4} . This is the assumed BDF for any product discharged through the open hazardous and open non-hazardous drains.

1.1.6. SUBSEA DISCHARGES

The Osborne-Adams risk assessment will be used for subsea discharges if required in variations to this permit. This risk assessment uses the following formulae;

Total quantity of chemical to be discharged (mg) Total expected discharge time in seconds	= Quantity of chemical released per second (QS)
Quantity in a litre to reach PNEC (mg) x volume water column (litres) QS x 3600	= Time taken to reach PNEC in hours (T1)
Residual current speed x 3,600 2 x 500	= Refreshment rate (hour^{-1}) (R)
Refreshment rate (R) ⁻¹	= Time taken to refresh column (hours) (T2)

An acceptable discharge is one where the time taken to discharge sufficient chemical to exceed PEC/PNEC = 1 in the 500 m radius column water is greater than the time taken to completely refresh that column of water (i.e. if $T1 > T2$), unless there are other local environmental sensitivities.

Any chemical discharge that requires Osborne-Adams assessment will have the 'OTH' discharge code use in the Portal and comment made regarding the discharge in the footnote.

The results of any Osborne-Adams assessment(s) will be presented in this document.

1.1.7. INJECTION RATES AND DOSAGES

It is expected that when production starts, the injection rates/dosages used in the field can be higher than the standard application dosage shown in Cefas templates. This is attributed to a number of reasons:

- Some biocidal, scale, and other similar treatments, follow a "shock tactic" to stimulate production, and prevent future operational difficulties. The dosage for "shock" treatments would therefore not be expected to be the same as for continual use in a production circumstance.
- For the distance that a product has to cover physically within pipelines where strong adsorption/desorption effects can take place, also means that a higher dosage is needed to ensure that there is enough residual chemical to confer the desired benefits for the full length of the pipeline.
- Issues of brine and material compatibility, as well as effects on other processes within the system where other chemical products are already utilised, further necessitate higher injection rates than those proposed on the corresponding Cefas templates. The latter are based mostly

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on laboratory or otherwise “ideal” experimental conditions and cannot take into account the multiple interactions found in actual field situations.

Chemical Risk Assessment**1.1.8. ANNUAL USAGE FIGURES**

Once production commences, the maximum application dosage for continuously applied products will be used for the purpose of CHARM modelling of the worst environmental scenario. This maximum application dosage will not be maintained on a continuous basis but will be adjusted to reflect the changing fluid composition of the producing wells. Consequently, the annual usage recorded will not correspond to a yearly equivalent of this maximum application dosage. The annual use will generally be lower. Therefore, it is not possible to directly convert tonnages into dosage in the case of continuously used chemicals. Product injection rates are decided following multidisciplinary assessment, laboratory experimentation, manufacturer recommendations and field results. It is from these results, combined with the latest well availability predictions obtained from Adura's most up-to-date business plan that the estimated annual quantity is calculated.

For batch treatment operations environmental modelling has been performed on the maximum batch size used in an operation to represent a worst-case scenario. However, a unique batch size is calculated for every treatment, dependant on a number of factors including flow characteristics and residual product levels. Therefore, the total use recorded for batch use products will not always correspond to the frequency of treatment multiplied by the maximum batch use. The total use may be lower as not all applications will use the maximum batch size.

1.1.9. ANNUAL DISCHARGE FIGURES

No discharge is expected to take place on the Jackdaw Wellhead Platform (WHP). All treated fluids will be routed to Shearwater. Any discharges that will take place on that asset will be added on the equivalent production permit and will be reported via the asset's EEMS reporting system.

For any products that will potentially be directly discharged (subsea or topsides) on the Jackdaw wellhead platform, a CHARM or Osborne Adams assessment will be performed (if applicable) and the equivalent figures will be reported via the EEMS system.

1.2. CHEMICAL USE ON JACKDAW WHP

A detailed description of the chemicals used on the Jackdaw WHP platform is presented below. Further justification has been included in the following circumstances:

- Where RQs >1;
- If RQs are calculated to be <1, but specific chemical has an HQ>1 (Silver, White, Orange, Blue and Purple); or
- Non-CHARMable chemicals with OCNS groups that indicate a significant toxic potential (i.e. OCNS category A, B or C).

For chemicals that are OSPAR Candidates for Substitution risk-based justifications have been included. Further detailed technical justification has been included in the annual substitution chemicals report. For products that have not previously been covered by the annual substitution chemicals report a full technical justification has been provided.

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DTI	Name	Chemical function group	Supplier	Template version	HQ	Chemical Label	Expiry date
5324	Castrol Brayco Micronic SV/3	Hydraulic Fluid	Castrol Holdings Europe B.V	12	C	SUB	18-Jun-27
30145	Castrol Brayco Micronic SV/4	Hydraulic Fluid	Castrol Holdings Europe B.V	3	D		21-Aug-29
23262	MEG (all grades)	Gas Hydrate Inhibitor	REDA Energy Ltd	11	E	PLO	24-Sep-29
23210	METHANOL (all grades)	Gas Hydrate Inhibitor	REDA Energy Ltd	12	E	PLO	29-Sep-29
2044	MONOETHYLENE GLYCOL(1,2 ETHANEDIOL)	Other	FIS Chemicals Limited	13	E	PLO	05-Mar-28
28630	PARA12193B	Wax Inhibitor	ChampionX (Champion Technologies Ltd)	5	Gold	SUB Plastics	20-Jun-28
27032	SCAL16662A	Scale Inhibitor	ChampionX (Champion Technologies Ltd)	5	Gold		01-Apr-27
23125	SOBO S GOLD 08	Detergent / Cleaning Fluid	Oil Technics Ltd	15	Gold		03-Jul-29
30445	Sobo S Gold 40	Detergent / Cleaning Fluid	Oil Technics Ltd	1	Gold		09-Jan-28

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1.2.2.CONTINUOUS USE AND DISCHARGE

1.2.2.1. PARA12193B (1 of 1)

Chemical name	PARA12193B	Supplier	ChampionX (Champion Technologies Ltd)				
Function	Wax Inhibitor	Application point	Production Header				
Application	1 of 1						
Treatment philosophy and application							
PARA12193B is continuously injected to the production header to inhibit wax deposition and liquid gelation. On start-up, production can be routed to the cold vent/closed drain drum for temperature management where PARA12193B can also be injected. PARA12193B is injected at a target rate of 500 ppm (458.05mg/L @ a relative density of 0.9161) based on the daily total produced oil (condensate) volume. However, during periods of reduced fluid flow to Shearwater dosing of wax inhibitor could occur at a dosage of 550 ppm (503.855 mg/L). The chemical is applied on Jackdaw hydrocarbon fluids with discharge occurring on the Shearwater host platform. PARA12193B will be continuously injected from start-up until such time as the wax properties (pour point and wax appearance temperature) of the condensate change due to reservoir pressure depletion e.g. the wax is left within the reservoir. The wax properties of the Jackdaw condensate will be determined by regulator sampling of the fluid. Usage for 2026 has been calculated by assuming use of PARA12193B at a dose rate of 550 ppm, based on the total oil volume, from 1st of September at the earliest. The annual use allowance for 2027 and 2028 reflects use of the product for a full calendar year.							
PLONOR	No	HQ category	Gold	Identified for substitution	Yes (Level 4)	RQ	CNA
CHARM data				Assumptions			
Dosage	N/A			N/A (discharge dosage is N/A as no discharge will occur on the asset.			
Fraction discharged	0%			There will be zero discharge at Jackdaw. All produced fluids from Jackdaw will be processed and discharged at Shearwater.			
CHARM algorithm code	CNA			Discharge code	ZEX		
Justification							
PARA12193B carries a UK National Plan Level 4 sub warning, this is due to a component (<15% w/w) which is classified as highly persistent (biodeg <20%). This product also carries a warning for plastics. At the time of chemical selection (2019 / 2020), PARA12193B did not have a substitution or plastics warning. No further chemical selection work can take place at present due to a lack of Jackdaw fluids available for testing. It is expected that the majority of the PARA12193B will be retained in the oil phase, resulting in minimal volumes of chemical discharged with the produced water at Shearwater. Currently there are no SUB-free products that have been identified as an alternative to PARA12193B. ChampionX is aware of the substitution warning and are continually developing more environmentally acceptable alternatives for use in the North Sea. There will be zero discharge of this product from Jackdaw to the marine environment. Therefore, no significant impact to the marine environment is expected.							

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1.2.2.2. SCAL16662A (1 of 1)

Chemical name	SCAL16662A	Supplier	ChampionX (Champion Technologies Ltd)				
Function	Scale Inhibitor	Application point	Various Wellheads				
Application	1 of 1						
Treatment philosophy and application							
SCAL16662A is scale inhibitor continuously injected into various wellheads of the Jackdaw producing wells. The product is used to prevent carbonate and sulphide scale formation throughout the process system. The product is applied continuously with a target dose rate of 400 ppm (468 mg/L @ a relative density of 1.17) based on the total produced water volume. However, during periods of reduced water fluid flow to Shearwater dosing of CRW85735 could occur at a dosage of up to 440 ppm (514.8 mg/L). Use of the product will only occur during observed produced water flow. The product will be discharged along with the produced water from Jackdaw at Shearwater. Therefore, there will be zero discharge of the product at Jackdaw. Usage for 2026, where no produced water is realistically expected, is set to 2,000 kg in order to allow a safety allowance (for the event of water production) for use of the scale inhibitor until a more accurate water rate is observed and the permit can be varied with this finetuned figure. Use for 2027 and 2028 has been calculated based on the target dose rate of 400 ppm, based on the daily total water volume, plus a small contingency.							
PLONOR	No	HQ category	Gold	Identified for substitution	No	RQ	CNA
CHARM data				Assumptions			
Dosage	N/A			N/A (discharge dosage is N/A as no discharge will occur on the asset).			
Fraction discharged	0%			There will be zero discharge at Jackdaw. All produced fluids from Jackdaw will be processed and discharged at Shearwater.			
CHARM algorithm code	CNA			Discharge code	ZEX		
Justification							
There will be zero discharge of this product from Jackdaw to the marine environment. Therefore, no significant impact to the marine environment is expected.							

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1.2.3. BATCH USE AND DISCHARGE

1.2.3.1. Castrol Brayco Micronic SV/4 (1 of 1)

Chemical name	Castrol Brayco Micronic SV/4	Supplier	Castrol Holdings Europe B.V				
Function	Hydraulic Fluid	Application point	Facility hydraulic systems				
Application	1 of 1						
Treatment philosophy and application							
Castrol Brayco Micronic SV/4 is a synthetic hydrocarbon based hydraulic control fluid. The product will be used for the hydraulic system on the Jackdaw WHP. The fluid has a low pour point allowing operation of controls systems in low ambient temperatures; the product is also resistant to bacterial growth and affords protection against system corrosion. The product is not expected to be discharged. However, there might be a requirement for minor top-ups and draining of the system throughout the year in order to account for sampling losses and subsequent top-ups. Any amount of fluid removed from the hydraulic system will be collected in drums and skipped onshore for disposal. Each top-up batch is not expected to exceed 169.5 kg, with the annual total usage allowance for the scope not exceeding 1,500 kg.							
PLONOR	No	HQ category	D	Identified for substitution	No	RQ	N/A
CHARM data				Assumptions			
Dosage	N/A			N/A			
Fraction discharged	0%			The product is used in a system with no operational discharge. Any fluid removed from the system is sent to shore for disposal.			
Batch dilution factor	N/A			N/A			
Batch use	169.5 kg			A batch of up to 169.5 kg will be used to top up hydraulic systems as and when required			
CHARM algorithm code	CNA			Discharge code	ZSS		
Justification							
This product is utilised in a closed system and as such no discharge to the marine environment is anticipated. Any hydraulic fluid that cannot be returned to the hydraulic system will be contained and sent onshore for disposal, there is no discharge to the marine environment.							

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1.2.3.2. Castrol Brayco Micronic SV/3 (1 of 1)

Chemical name	Castrol Brayco Micronic SV/3	Supplier	Castrol Holdings Europe B.V										
Function	Hydraulic Fluid	Application point	Pre-filled umbilical cores										
Application	1 of 1												
Treatment philosophy and application													
Castrol Brayco Micronic SV/3 is a synthetic hydrocarbon based hydraulic control fluid. Jackdaw umbilical cores were pre-filled with Castrol Brayco Micronic SV/3 when they were manufactured and sealed. The umbilical filled with Castrol Brayco Micronic SV/3 will be used to control the SSIV. Once the product has been used to open the SSIV it will be returned to the hydraulic power unit tank on valve closure. There will be zero discharge to the environment as the umbilical is a closed system. Therefore, this application represents zero use and zero discharge of Castrol Brayco Micronic SV/3. The annual use and discharge allowance have both been set to zero on the UK Energy portal.													
PLONOR	No	HQ category	C	Identified for substitution	Yes (Level 4)	RQ	N/A						
CHARM data				Assumptions									
Dosage	N/A			N/A									
Fraction discharged	0%			The product is used in a closed system with no operational discharge.									
Batch dilution factor	N/A			N/A									
Batch use	0 kg			N/A									
CHARM algorithm code	CNA			Discharge code	ZCS								
Justification													
No discharge is expected and as such the application is not expected to pose a significant risk to the receiving marine environment. Castrol Brayco Micronic SV/3 is a synthetic oil based subsea hydraulic control fluid used to fill closed subsea production control systems and actuate subsurface safety valves, that is intended for use in closed systems and is not intended for discharge during normal production operations. Castrol Brayco Micronic SV/3 is an OCNS C category product due to one component present in the formulation at < 5%. The product is not acutely toxic (worst case aquatic toxicity = 11.3 mg/L), The component has the potential to bioaccumulate and a relatively low algal toxicity but is readily biodegradable. In addition, Castrol Brayco Micronic SV/3 contains one component, present at <10% which is considered to be non-biodegradable based on the UK substances in solvents approach (adopted in 2022/ 2023), but it is minimally toxic and is expected to have a low bioaccumulation potential. This results in the assignment of a Substitution warning at UKNP Level 4. Adura has replaced Castrol Brayco Micronic SV/3 with the alternative, substitution warning free, product Castrol Brayco Micronic SV/4 where practicable. However, as the umbilical cores were pre-filled during the manufacturing process there are no plans to replace this with Castrol Brayco Micronic SV/4 at present. If this changes, the permit will be updated accordingly.													

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1.2.3.3. METHANOL (all grades) (1 of 1)

Chemical name	METHANOL (all grades)	Supplier	REDA Energy Limited										
Function	Gas Hydrate Inhibitor	Application point	Well trees										
Application	1 of 1												
Treatment philosophy and application													
METHANOL (all grades) is a gas hydrate inhibitor which is used to suppress the formation of gas hydrates through the Joule-Thomson effect. It will be batch dosed to the Jackdaw production well trees upstream of the choke. METHANOL (all grades) will be typically applied when cold start-ups are required and for pressure equalisation across the downhole safety valve. When flowed back with the well fluids, the product will ultimately be discharged through the produced water system at Shearwater. There will be zero discharge of this product at Jackdaw.													
PLONOR	Yes	OCNS category	E	Identified for substitution	No	RQ	CNA						
CHARM data				Assumptions									
Dosage	N/A			N/A									
Fraction discharged	0%			There will be no discharge at Jackdaw. All Jackdaw production fluids will be processed and discharged at Shearwater.									
Batch dilution factor	N/A			N/A									
Batch use	41,000 kg			Batch sizes of up to 41,000 kg will be used as required									
CHARM algorithm code	CNA			Discharge code	ZEX								
Justification													
METHANOL (all grades) is OCNS E registered and is on the OSPAR PLONOR list. There will be zero discharge of this product from Jackdaw to the marine environment. Therefore, no significant impact to the marine environment is expected.													

1.2.3.4. MEG (all grades) (1 of 1)

Chemical name	MEG (all grades)	Supplier	REDA Energy Limited				
Function	Gas Hydrate Inhibitor	Application point	A & B Annuli at Subsea Wellheads				
Application	1 of 1						
Treatment philosophy and application							
MEG (all grades) will be mixed with water to achieve a 60:40 (Water:MEG (all grades) mixture prior to use as a temporary annulus fluid during preparation of the A and B annuli at the subsea wellheads for initial well start-up The MEG (all grades) / water mixture will be used to support annulus pressure management / thermal balancing during the initial start-up phase. As the wells are brought online and operating conditions stabilise, the annulus fluid will be displaced using nitrogen and routed to tote tanks for containment and disposal onshore. The maximum batch application of MEG (all grades) is 2,592 kg (~2,273 L @ a relative product density of 1.14).							
PLONOR	Yes	OCNS category	E	Identified for substitution	No	RQ	CNA

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CHARM data		Assumptions	
Dosage	N/A	N/A	
Fraction discharged	0%	No discharge will occur. The product will be shipped onshore for treatment and disposal.	
Batch dilution factor	N/A	N/A	
Batch use	2,592 kg	Batch sizes of up to 2,592 kg will be used as required	
CHARM algorithm code	CNA	Discharge code	ZSS
Justification			
MEG (all grades) is OCNS E registered and is on the OSPAR PLONOR list. MEG (all grades) will not be discharged to the environment, instead it will be contained and shipped to shore for treatment and disposal.			

1.2.3.5. SOBO S GOLD 08 (1 of 1)

Chemical name	SOBO S GOLD 08	Supplier	Oil Technics Ltd					
Function	Detergent / Cleaning Fluid	Application point	Applied as required to various areas of the installation: decks, walkways and stairwells.					
Application	1 of 1							
Treatment philosophy and application								
SOBO S GOLD 08 is a detergent that is used as a cleaning agent for deck washes and general cleaning use. The product is used as and when required in a batch size of up to 105 kg, during the monthly maintenance visits. In the product information sheet, the chemical vendor recommends that as a general-purpose rig wash this product should be used at an approximate concentration of 5%. This corresponds to the registered dosage on the Cefas template. However, it is also recommended that the product can be used neat for heavy duty degreasing applications. Adura's standard operating procedure of a 1:100 dilution for standard application and a 1:10 dilution for heavy contamination results in dosages that are both less than the application dosages suggested by the supplier. Following application water is used to rinse product residues. These washings are then directed to the non-hazardous drains system. It follows that the actual discharge concentration is, in reality, orders of magnitude lower than the applied concentration; however, an accurate calculation is not possible. As a worst-case estimate the discharge dosage has been determined by the maximum batch size (105 kg) divided by the volume of the non-hazardous drains (3 m³) to give a concentration of 35,000 mg/L. It is expected that a portion of the product partition to the oil phase within the non-hazardous drains system. As this cannot be accurately quantified as worst-case 100% discharge has been recorded.								
PLONOR	No	HQ category	Gold	Identified for substitution	No	RQ	Year	RQ
							2026	<1
							2027	<1
							2028	<1
CHARM data				Assumptions				
Dosage	35,000 mg/L			A worst-case dosage of 35,000 mg/L has been assumed. This dosage has been calculated by dividing the batch size (105 kg) by the non-hazardous drains volume (3 m³).				

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Fraction discharged	100%	A default value of 100% discharge is assumed for all products modelled using the CWS CHARM algorithm.	
Batch dilution factor	1.79E-04	Density of fluid discharged overboard: 1.036 g/cm ³ Volume Discharged: 3 m ³ (Minimum allowed in CHARM) Discharge Rate: 60 m ³ /hour (Minimum allowed in CHARM) Discharge volume of 3 m ³ is the standard used for non-hazardous drains discharges.	
Batch use	105 kg	Batch sizes of up to 105 kg will be used as and when required	
CHARM algorithm code	CWS	Discharge code	BAT
Justification			
The RQ generated was <1, indicating that the discharge would not be expected to pose a significant risk to the receiving environment.			

1.2.3.6. Sobo S Gold 40 (1 of 1)

Chemical name	Sobo S Gold 40	Supplier	Oil Technics Ltd					
Function	Detergent / Cleaning Fluid	Application point	Applied as required to various areas of the installation: decks, walkways and stairwells.					
Application	1 of 1							
Treatment philosophy and application								
Sobo S Gold 40 is a detergent that is used as a cleaning agent for deck washes and general cleaning use. It is an alternative detergent product to SOBO S GOLD 08 (Section 1.2.3.5). The supplier has advised that SOBO S GOLD 08 will be discontinued. Therefore, to mitigate against emergency permit variations, Sobo S Gold 40 has been added to the permit as a contingency in case SOBO S GOLD 08 is unavailable. The product is used as and when required in a batch size of up to 105 kg, during the monthly maintenance visits. In the product information sheet, the chemical vendor recommends that as a general-purpose rig wash this product should be used at an approximate concentration of 5%. This corresponds to the registered dosage on the Cefas template. However, it is also recommended that the product can be used neat for heavy duty degreasing applications. Adura's standard operating procedure of a 1:100 dilution for standard application and a 1:10 dilution for heavy contamination results in dosages that are both less than the application dosages suggested by the supplier. Following application water is used to rinse product residues. These washings are then directed to the non-hazardous drains system. It follows that the actual discharge concentration is, in reality, orders of magnitude lower than the applied concentration; however, an accurate calculation is not possible. As a worst-case estimate the discharge dosage has been determined by the maximum batch size (105 kg) divided by the volume of the non-hazardous drains (3 m³) to give a concentration of 35,000 mg/L. It is expected that a portion of the product partition to the oil phase within the non-hazardous drains system. As this cannot be accurately quantified as worst-case 100% discharge has been recorded.								
PLONOR	No	HQ category	Gold	Identified for substitution	No	RQ	Year	RQ
							2026	<1
							2027	<1
							2028	<1
CHARM data				Assumptions				

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Dosage	35,000 mg/L	A worst-case dosage of 35,000 mg/L has been assumed. This dosage has been calculated by dividing the batch size (105 kg) by the non-hazardous drains volume (3 m ³).	
Fraction discharged	100%	A default value of 100% discharge is assumed for all products modelled using the CWS CHARM algorithm.	
Batch dilution factor	1.79E-04	Density of fluid discharged overboard: 1.036 g/cm ³ Volume Discharged: 3 m ³ (Minimum allowed in CHARM) Discharge Rate: 60 m ³ /hour (Minimum allowed in CHARM) Discharge volume of 3 m ³ is the standard used for non-hazardous drains discharges.	
Batch use	105 kg	Batch sizes of up to 105 kg will be used as and when required	
CHARM algorithm code	CWS	Discharge code	BAT
Justification			
The RQ generated was <1, indicating that the discharge would not be expected to pose a significant risk to the receiving environment.			

1.2.3.7. MONOETHYLENE GLYCOL (1,2 ETHANEDIOL) [MEG]

Chemical name	MONOETHYLENE GLYCOL (1,2 ETHANEDIOL)	Supplier	FIS Chemicals Limited				
Function	Other	Application point	Various (Storage Vessels and pumping systems).				
Application	1 of 1						
Treatment philosophy and application							
MONOETHYLENE GLYCOL (1,2 ETHANEDIOL) [MEG] will be used in various systems as part of the topsides commissioning programme. There is a requirement to commission a number of storage and pumping systems on the wellhead platform. This requires the use of a MEG/water mix to fill the systems. It is currently expected that a 70% water 30% MEG (70/30) mixture will be used to undertake the commissioning although the potential exists for this to be changed to a 60/40 (water/MEG) mixture. The need for the is primarily two-fold as follows: 1. MEG is required to prevent any potential for water only, (un-MEG treated), to be left in the associated pipework following commissioning to prevent the possibility of future hydrate formation, and 2. To facilitate the drying activities following the commissioning activities. The systems will be air dried following system testing by blowing air through the system. On completion of the commissioning activities a nitrogen blanket will be left in the system until such time as the final commissioning is undertaken later in the year. Maximum application volume (batch size) for the systems to be commissioned is 21 m³ (just under 23,500 kilograms) of MONOETHYLENE GLYCOL (1,2 ETHANEDIOL). Discharge assumption: The applied MEG / water will be discharged to the platforms drainage system during the commissioning activities and then discharged to sea via the drainage caisson at 10 metres below LAT. This will occur over a period of several days.							
PLONOR	Yes	OCNS category	E	Identified for substitution	No	RQ	N/A

Chemical Risk Assessment

CHARM data		Assumptions	
Dosage	N/A	N/A	
CHARM Fraction discharged	N/A	A worst-case discharge of 100% has been assumed but no modelling is required as OCNS E and PLONOR.	
Batch dilution factor	N/A	N/A	
Batch use	23,500 kg	A maximum batch size of 23,500 kg will be required as the total maximum volume of MEG/Water required to commission the systems is approximately 70 m ³ . This is for the 60/40 (water/MEG) mixture, it is planned to use a 70/30 (water/MEG) mixture and in this case total use and discharge of the MEG will be lower.	
CHARM algorithm code	CNA	Discharge code	BAT
Justification			
MONOETHYLENE GLYCOL (1,2 ETHANEDIOL) is designated as OCNS E, PLONOR and will therefore not adversely affect the surrounding marine environment.			

2. CONCLUSIONS

Potential sensitivities, including low numbers of cetaceans, fish spawning and nursery areas and high seabird vulnerability have been identified in the vicinity of the Jackdaw platform. Commercial fishing is a socioeconomic sensitivity within the area.

There are no products on the permit that have an RQ >1. The sensitivities described in the corresponding Environmental Assessment Justification are therefore not expected to be adversely impacted by the chemical applications associated with activities at the Jackdaw platform.

Adura Operations Limited therefore concludes that the chemical use associated with the Jackdaw platform is predicted to have no significant effect upon the surrounding environment.