APPENDIX 5C

Determination of Chemical Hazard Categories

1. CHARM

The Offshore Chemical Notification Scheme (OCNS) conducts hazard assessments on chemical products that are used offshore. The CHARM model calculates the ratio of Predicted Effect Concentration against No Effect Concentration (PEC: NEC), and is expressed as a Hazard Quotient (HQ), which is then used to rank the product. The HQ is converted to a colour banding (see Table 1 below), which is then published in the Definitive Ranked Lists of Approved Products, Excel format (ZIP, 355.62 KB, updated 3 August 2010). The PEC is estimated for a standard platform with a standard mixing zone and a standardised estimate of tidal advection. PEC also takes into account standard chemical usage rates and includes an estimate of the fraction released (based on oil-water partitioning data). NEC is derived from the results of standardised acute toxicity tests, using an application factor of 10-1000 (the selection of the application factor is built in to the model and reflects the type and quantity of toxicity data available). Data used in the CHARM assessment include toxicity, biodegradation and bioaccumulation, and the model is divided into 4 main algorithms: Production, Completion / Workover, Drilling and Cementing.

Although the current OCNS is based on hazard assessment, it remains primarily a ranking system; the actual HQ values are dependent on assumptions about the size of the mixing zone and on the rate of dispersion, and these assumptions will not be valid for the Caspian. However, the rankings remain valid for any consistent set of assumptions, and will therefore provide a reliable indication of relative environmental effects for all water bodies.

Table 1 The OCNS HQ and Colour Bands

Minimum HQ value	Maximum HQ value	Colour banding	
>0	<1	Gold	
≥1	<30	Silver	
≥30	<100	White	Lowest Hazard ↓
≥100	<300	Blue	Highest Hazard
≥300	<1000	Orange	
≥1000		Purple	

2. Non-CHARM (Old OCNS Ranking)

Products not applicable to CHARM model (i.e. inorganic substances, hydraulic fluids or chemicals used only in pipelines) are assigned an OCNS grouping A – E, with A being the greatest potential environmental hazard and E being the least (see Table 2 below).

This system awards the offshore chemical a letter grouping between A and E. (N.B. care should be taken not to confuse these values with the results of the Netherlands pre-screening scheme). Each individual substance in an offshore chemical should be ranked by applying the OCNS Ranking Scheme. The overall ranking is determined by that substance having the worst case OCNS ranking scheme assignment. The method of assignment of the OCNS letter grouping is described below.

2.1 Initial Grouping

The initial group is determined using Table 2. All submitted toxicity data for the product are compared with the table and the value giving the worst case 'Initial Grouping' (i.e. the test giving the most toxic response) is used as the Initial Group for the substance.

Table 2 Initial OCNS Grouping

Initial Grouping	A	B	C	D	E
Result for Aquatic toxicity data (ppm)	<1	>1-10	>10-100	>100-1,000	>1,000
Result for sediment toxicity data (ppm)	<10	>10-100	>100-1,000	>1,000-10,000	>10,000

- **Aquatic toxicity** refers to the Skeletonema costatum EC_{50}, Acartia tonsa LC_{50}, and Scophthalmus maximus (juvenile turbot) LC_{50} toxicity tests; and
- **Sediment toxicity** refers to the Corophium volutator LC_{50} test.

2.2 Adjustment for Environmental Performance to Determine Final Group

The final grouping is determined using Table 3 as a guide. Select the column that applies to the candidate product and adjust the initial Group accordingly. If the classification should theoretically move beyond Group A or E, the product will nevertheless be assigned to that particular Group.

Table 3 Adjustment Criteria for OCNS Grouping

Increase by 2 Groups e.g. From C to E	Increase by 1 Group e.g. from C to D	Do not adjust initial grouping	Decrease by 1 group e.g. From C to B	Decrease by 2 groups e.g. From C to A
Substance is readily biodegradable and is non-bioaccumulative	Substance is inherently biodegradable and is non-bioaccumulative	Substance is not biodegradable and is non-bioaccumulative or	Substance is inherently biodegradable and bioaccumulates	Substance does not biodegrade and bioaccumulates
		Substance is readily biodegradable and bioaccumulates		

Definitions of terms used in the classification table:

- **Readily biodegradable** - Results of >60% biodegradation in 28 days to an OSPAR HOCNF accepted ready biodegradation protocol;
- **Inherently biodegradable** - Results of >20% and <60% to an OSPAR HOCNF accepted ready biodegradation protocol or result of >20% by OSPAR accepted Inherent biodegradation study;
- **Not biodegradable** - Results from OSPAR HOCNF accepted ready biodegradation protocol or inherent biodegradation protocol are <20%;

- **Non-bioaccumulative/non-bioaccumulating** - Log Pow <3, or results from a bioaccumulation test (preferably using Mytilus edulis) demonstrates a satisfactory rate of uptake and depuration, or the molecular mass is > 700;
- **Bioaccumulative/Bioaccumulates** - Log Pow >3, or results from a bioaccumulation test (preferably using Mytilus edulis) demonstrates an unsatisfactory rate of uptake and depuration, and the molecular mass is < 700;
- **Aquatic toxicity test result** - LC/EC_{50} data for Skeletonema costatum, Acartia tonsa or Scophthalmus maximus (Juvenile turbot) (units = ppm or mg/litre); and
- **Sediment toxicity test result** - LC_{50} data for Corophium volutator (units = ppm or mg/kg).