

## **APPENDIX 5B**

### **Shah Deniz 2 Project Composition and Function of Key SD2 Chemicals with Potential for Discharge**



The tables in this Appendix provide a list of the product name, chemical composition, function, and usage of key products which will, or could potentially, be discharged to sea during all phases of the Shah Deniz (SD) 2 Project. The tables also indicate the environmental rating of each product.

Chemicals with the most favourable available environmental rating have been selected for the project, with the aim of minimising the environmental impact of any unavoidable discharges. The composition and chemistry of each planned or potential discharge has been fully taken into account in the impact assessment process.

**Table 1: Drilling Chemicals**

Product	Composition	Function	Total Worst Case Discharge Volume per Hole (Tonnes)	Rating	Activity	Application
Barite	Barium sulphate	Weighting Agent	648	E	Drilling	Pilot Hole Drilling (Seawater / PHB Sweeps/ WBM)
Bentonite	Bentonite	Viscosifier	30	E	Drilling	Pilot Hole Drilling (Seawater / PHB Sweeps/ WBM)
Soda Ash	Soda Ash	Alkalinity Control	3	E	Drilling	Pilot Hole Drilling (Seawater / PHB Sweeps/ WBM)
Polypac UL	Poly Anionic Cellulose	Water Soluble Polymer Designed to Control Fluid Loss	6	E	Drilling	Pilot Hole Drilling (WBM)
Duovis	Xanthan Gum	Viscosifier	4	E	Drilling	Pilot Hole Drilling (WBM)
Nut Plug	Nut Shells	LCM /Pipe Scouring	3	E	Drilling	Pilot Hole Drilling (WBM)
Barite	Barite	Weighting Agent	1200	E	Drilling	Geotechnical Hole (Seawater / PHB Sweeps/ WBM)
Bentonite	Bentonite	Viscosifier	90	E	Drilling	Geotechnical Hole (Seawater / PHB Sweeps/ WBM)
Soda Ash	Soda Ash	Alkalinity Control	7	E	Drilling	Geotechnical Hole (Seawater / PHB Sweeps/ WBM)
Polypac UL	Poly Anionic Cellulose	Water Soluble Polymer Designed to Control Fluid Loss	12	E	Drilling	Geotechnical Hole (WBM)
Duovis	Xanthan Gum	Viscosifier	6	E	Drilling	Geotechnical Hole (WBM)
Nut Plug	Nut Shells	LCM /Pipe Scouring	3	E	Drilling	Geotechnical Hole (WBM)
Barite	Barite	Weighting Agent	116	E	Drilling	42" Section (Seawater / PHB Sweeps/ WBM)
Bentonite	Bentonite	Viscosifier	35	E	Drilling	42" Section (Seawater / PHB Sweeps/ WBM)
Soda Ash	Soda Ash	Alkalinity Control	1	E	Drilling	42" Section (Seawater / PHB Sweeps/ WBM)
Polypac UL	Poly Anionic Cellulose	Water Soluble Polymer Designed to Control Fluid Loss	2.1	E	Drilling	42" Section (WBM)
Duovis	Xanthan Gum	Viscosifier	0.35	E	Drilling	42" Section (WBM)
Nut Plug	Nut Shells	LCM /Pipe Scouring	0.7	E	Drilling	42" Section (WBM)

Product	Composition	Function	Total Worst Case Discharge Volume per Hole (Tonnes)	Rating	Activity	Application
Magnesium oxide	Magnesium oxide	pH control	3	E	Drilling	42" Section (WBM)
Barite	Barite	Weighting Agent	289	E	Drilling	32" Section (Seawater / PHB Sweeps/ WBM)
Bentonite	Bentonite	Viscosifier	54	E	Drilling	32" Section (Seawater / PHB Sweeps/ WBM)
Soda Ash	Soda Ash	Alkalinity Control	0.7	E	Drilling	32" Section (Seawater / PHB Sweeps/ WBM)
Polypac UL	Poly Anionic Cellulose	Water Soluble Polymer Designed to Control Fluid Loss	3.5	E	Drilling	32" Section (WBM)
Duovis	Xanthan Gum	Viscosifier	0.85	E	Drilling	32" Section (WBM)
Nut Plug	Nut Shells	LCM /Pipe Scouring	1.4	E	Drilling	32" Section (WBM)
Magnesium oxide	Magnesium oxide	pH control	3	E	Drilling	32" Section (WBM)
Barite	Barite	Weighting Agent	1826	E	Drilling	28" Section (Seawater / PHB Sweeps/ WBM)
Soda Ash	Soda Ash	Alkalinity Control	2	E	Drilling	28" Section (Seawater / PHB Sweeps/ WBM)
Polypac UL	Poly Anionic Cellulose	Water Soluble Polymer Designed to Control Fluid Loss	19	E	Drilling	28" Section (WBM)
Duovis	Xanthan Gum	Viscosifier	5	E	Drilling	28" Section (WBM)
Potassium Chloride	Salts (KCl)	Borehole Stabiliser/Shale Inhibitor	325	E	Drilling	28" Section (WBM)
Ultrahib	Poly Ether Amine/Poly Ether Amine Acetate Blend	Shale Inhibitor	96	GOLD	Drilling	28" Section (WBM)
Ultracap	Aliphatic Terpolymer	Anti-Accretion Additive	7	GOLD	Drilling	28" Section (WBM)
Ultrafree	Ester/Alkenes C15-C18 Blend	Shale Encapsulator	92	GOLD	Drilling	28" Section (WBM)
Super Sweep	Polypropylene Fibres	Hole Cleaning Agent	2	GOLD	Drilling	28" Section (WBM)
STARCARB	Oil well chemical containing quarts	Sealing/Bridging Agent	15	E	Drilling	Drilling Contingency Chemical (WBM)

Product	Composition	Function	Total Worst Case Discharge Volume per Hole (Tonnes)	Rating	Activity	Application
STEELSEAL	Calcined petroleum coke	Sealing/Bridging Agent	15	E	Drilling	Drilling Contingency Chemical (WBM)
EZ SPOT	Pipe freeing agent	Spotting Fluid	2.3	Not Currently Listed Into UK OCNS Ranked Lists of Notified Products	Drilling	Drilling Contingency Chemical (WBM)
STARCIDE	N,N-methylene-bis(5-methyloxazolidine)	Biocide	1.3	GOLD	Drilling	Drilling Contingency Chemical (WBM)
OXYGON	OXYGON: granulate / powder	Oxygen Scavenger	0.3	GOLD	Drilling	Drilling Contingency Chemical (WBM)
SOURSCAV	Synthetic chemical compound	H <sub>2</sub> S Scavenger	1.9	GOLD	Drilling	Drilling Contingency Chemical (WBM)
Bentonite	Bentonite	Viscosifier	5	E	Drilling	Drilling Contingency Chemical (WBM)
Sodium Bicarbonate	Sodium Bicarbonate	Alkalinity Control	1	E	Drilling	Drilling Contingency Chemical (WBM)
Magnesium Oxide	Magnesium Oxide	pH Control	6	E	Drilling	Drilling Contingency Chemical (WBM)

**Table 2: Cementing Chemicals**

Product	Composition	Function	Total Worst Case Discharge Volume per Hole (Tonnes)	Rating	Activity	Application
Cement Class G D907	Cement	Cement	151	E	MODU Cementing	Section Casing Cementing
Antifoaming Agent D206	Dimethyl Siloxanes, Silicones And Sorbitan Stearate	Antifoam Agent	0.77	Gold	MODU Cementing	Section Casing Cementing
Silicate Additive D075	Silicic Acid, Sodium Salt	Cement Additive	0.91	E	MODU Cementing	Section Casing Cementing
Hematite Weighting Agent D076	Hematite	Weighting Agent	1	E	MODU Cementing	Section Casing Cementing
Liquid Accelerator D077	Calcium Chloride	Accelerator	0.3	E	MODU Cementing	Section Casing Cementing
SALTBOND II Additive D080A	Solution Of Aromatic Polymer	Dispersant	0.25	Not Currently Listed Into UK OCNS Ranked Lists of Notified Products	MODU Cementing	Section Casing Cementing
Liquid Retarder D081	Lignosulfonate	Low Temperature Retarder	0.4	E	MODU Cementing	Section Casing Cementing
D095 Cement Additive	Glass Fiber	Cement Additive	0.28	E	MODU Cementing	Section Casing Cementing
Litefil D124 extender	Aluminium silicate	Solid Extender, cement additive.	19	E	MODU Cementing	Section Casing Cementing
Low Temperature Liquid Dispersant D145A	Sulfonated Melamine-Formaldehyde	Dispersant	0.97	Gold	MODU Cementing	Section Casing Cementing

Product	Composition	Function	Total Worst Case Discharge Volume per Hole (Tonnes)	Rating	Activity	Application
Retarder D177	Organic Salts	Mid Temperature Retarder	1.365	Not Currently Listed Into UK OCNS Ranked Lists of Notified Products	MODU Cementing	Section Casing Cementing
Low Temperature Dispersant D185	Polycarboxylic Polymer	Low Temperature Dispersant	0.35	Gold	MODU Cementing	Section Casing Cementing
Low Temperature Cement Set Enhancer D186	Accelerator	Cement or Cement Additive	0.1	Gold	MODU Cementing	Section Casing Cementing
Ultralite D188	Glass	Extender	4	E	MODU Cementing	Section Casing Cementing
Fluid Loss Control Additive D193	Polymer Aqueous	Fluid Loss Agent	2.7	Gold	MODU Cementing	Section Casing Cementing
Losseal W D199	Losseal W D199	Lost Circulation Material	0.9	Gold	MODU Cementing	Section Casing Cementing
GASBLOK LT D500	Polymeric Microgels	Cement or Cement Additive	6.18	Gold	MODU Cementing	Section Casing Cementing
D600 GASBLOK Gas Migration Control Additive	Latex Particles, Surfactant	Cement or Cement Additive	5.4	Gold	MODU Cementing	Section Casing Cementing
Mid-Temp Retarder-L D	Lignosulfonate Retarder	Cement or Cement Additive	0.3	E	MODU Cementing	Section Casing Cementing
MUD PUSH II Spacer D182	Sulfonated Organic Polymer, Glucoside Polymer	Cement or Cement Additive	0.77	Gold	MODU Cementing	Section Casing Cementing
D168	Fluid Loss Control Additive	Fluid Loss Control Additive	3.4	Gold	MODU Cementing	Section Casing Cementing
D209 Extender	Extender	Cement or Cement Additive	4	E	MODU Cementing	Section Casing Cementing
Cement Class G D907	Cement	Cement	16	E	MODU Cementing	Cement Unit Washing



**Table 3: Blow Out Preventer Fluid Chemicals**

Chemical	Total Worst Case Discharge Volume (Litres), per Well for Two Pods Testing	Activity	Application
Propylene Glycol	513	Drilling	BOP Testing
Ethylene glycol	30.78	Drilling	BOP Testing
Monoethanolamine	10.26	Drilling	BOP Testing
Triazine	5.13	Drilling	BOP Testing
Triethanolamine	10.26	Drilling	BOP Testing

**Table 4: Commissioning and Operations Chemicals**

Product	Composition	Function	Total Worst Case Discharge Volume (m <sup>3</sup> )	Rating	Activity	Application	Concentration in Discharge/Dosing Regime
Hydrosure HD50000	Combined Biocide, Corrosion Inhibitor and Oxygen Scavenger	Treat seawater used for hydrotesting	0.75	Gold	Jacket Installation	Jacket Ballasting	1000ppm
Tros Seadye	Tros Seadye	Dye	0.075	Gold	Jacket Installation	Jacket Ballasting	100ppm
Hydrosure HD50000	Combined Biocide, Corrosion Inhibitor and Oxygen Scavenger	Treat seawater used for hydrotesting	455	Gold	Subsea Export Pipelines	Pipeline Pre Commissioning	1000ppm
Tros Seadye	Tros Seadye	Dye	45	Gold	Subsea Export Pipelines	Pipeline Pre Commissioning	100ppm
Hydrosure HD50000	Combined Biocide, Corrosion Inhibitor and Oxygen Scavenger	Treat seawater used for hydrotesting	33	Gold	Infield Subsea Flowlines	Flowlines Pre Commissioning	1000ppm
Tros Seadye	Tros Seadye	Dye	3.3	Gold	Infield Subsea Flowlines	Flowlines Pre Commissioning	100ppm
Mono Ethylene Glycol (MEG)	MEG	MEG used to pre-fill subsea components	63	E	Subsea Infrastructure	Subsea Infrastructure Installation	n/a
MEG	MEG	MEG used to pre-fill subsea components	33.8	E	Subsea Infrastructure Intervention	Production Tree Replacement	n/a
Castrol Transqua HC10	Water Based Control Fluid	Subsea control system fluid	286.3	D	Valve Operations and Discharge	Subsea Operations	n/a

Note: Volume of Castrol Transqua HC10 per discharged varies between approximately 4.5 litres per thousand barrel of condensate produced (plateau) to 0.2 litres per thousand barrel of condensate produced (end of PSA)