



CO-Solve Solutions

INTRODUCTION

A Division of Courage Oilfield Services Ltd.

CONTENT

- ADVANTAGES
- PRODUCT OFFERINGS
- SUMMARY

ADVANTAGES

- PROVEN ABILITY TO SUCCESSFULLY MARKET UNIQUE CHEMICAL TECHNOLOGIES INTO THE INDUSTRY
- PRESENTLY A HIGH DEMAND FOR COST EFFECTIVE SOLUTIONS FROM LOCALLY COMMITTED, AREA FOCUSED SERVICE & SUPPLY COMPANIES
- UTILIZE 'IN-HOUSE' BLENDING AND LOGISTICS TO REDUCE END-USER COSTS
- ABILITY TO PROVIDE CLIENT SOLUTIONS WITH SIMPLE, EFFECTIVE, PROVEN CHEMISTRIES RATHER THAN COMPLEX, EXPENSIVE R&D BASED TECHNOLOGIES
- TECHNICAL INDUSTRY EXPERTISE/EXPERIENCE AVAILABLE WHEN REQUIRED

PRODUCT OFFERINGS

- SOLVENT/ACID SYSTEMS
- SCAVENGERS
- WATER CONDITIONER
- IRON SULPHIDE INHIBITOR/CONTROLLER
- MILLING/DRILLING CHEMISTRIES
- MISCELLANEOUS PRODUCTS

CO-SOL

- DESIGNED TO MAXIMIZE COMPONENT EFFECTIVENESS AND MINIMIZE USER COST BY USING LOCALLY AVAILABLE RAW COMMODITIES
- HIGH DEGREE OF HYDROCARBON SOLVENCY, AND FORMATION WATER-WETTING CHARACTERISTICS
- UNIQUE ADDITIVES REMAIN IN-SITU TO REDUCE FUTURE DAMAGE POTENTIAL
- SURFACTANT SYSTEM ALLOWS SOLVENT TO BE EMULSIFIED WITH WATER BASED FLUIDS (INCLUDING ACIDS) TO EXTEND FLUID REACH AND ENSURE NO BLEND SEPARATION OCCURS DURING MIXING/PLACEMENT

CO-ACID

- COMPLETELY INHIBITED, PRE-BLENDED, HIGH-STRENGTH ACID SYSTEM (UP TO 28% HCl ACID EQUIVALENT STRENGTH)
- LESS HAZARDOUS THAN CONVENTIONAL HIGH STRENGTH HCl ACID SYSTEMS
- CATIONIC AND ANIONIC SYSTEMS AVAILABLE
- ENHANCED DISSOLVING CAPABILITY ON CEMENT, SCALE, AND FORMATION
- HIGH TEMPERATURE CAPABLE ($>200^{\circ}\text{C}$)
 - VERY LOW CORROSION RATES AT EXTENDED EXPOSURE TIMES
 - HIGH TEMPERATURE STABILITY...NO DECOMPOSITION

CO-ACID (CONTINUED)

- CAN BE CUSTOMIZED TO SUIT SPECIFIC APPLICATIONS AND FORMATIONS
- COMPATIBLE WITH CO-SOL AND CO-SCAV SYSTEMS
- AVAILABLE SANDSTONE SYSTEM (NO 'ON-SITE' MIXING REQUIRED)
- CAN BE FOAMED, GELLED, EMULSIFIED OR ENERGIZED (N_2 & CO_2)
- EXTREMELY COST-EFFECTIVE IN SMALL OR LARGE VOLUMES
 - AVAILABLE IN PAILS, DRUMS, TOTES OR BULK VOLUME
- IDEAL FOR FRACTURING SPEARHEADS, PRODUCTION OPTIMIZATION & GENERAL SCALE REMOVAL

CO-SCAV1

- LIQUID BASED H₂S SCAVENGER
 - IDEAL FOR VENT-LINE SCRUBBERS AND SURFACE BASED SCAVENGER ADDITION
 - NON-REVERSIBLE, NON-FOAMING AND NON-EMULSIFYING
 - MOST EFFICIENT SCAVENGER CHEMISTRY AVAILABLE
 - MANUFACTURED AS AN ENVIRONMENTALLY RESPONSIBLE PRODUCT
 - READILY BIODEGRADABLE, NON-REGULATED BY-PRODUCTS GENERATED

CO-SCAV2

- LIQUID BASED H₂S AND ODOUR SCAVENGER
 - IDEAL FOR SURFACE BASED ADDITION AND TANK CLEANING APPLICATIONS
 - QUICKLY AND EFFICIENTLY REMOVES SULPHUR COMPONENTS AND MERCAPTANS
 - NON-REVERSIBLE, NON-FOAMING AND NON-EMULSIFYING
 - MANUFACTURED AS AN ENVIRONMENTALLY RESPONSIBLE PRODUCT
 - READILY BIODEGRADABLE, NON-TOXIC BY-PRODUCTS GENERATED
 - WILL NOT AFFECT PRODUCED FLUIDS OR CHEMISTRIES

CO-SCAV3

- LIQUID BASED H₂S SCAVENGER
 - IDEAL FOR DOWNHOLE AND SURFACE BASED SCAVENGER INJECTION
 - NO SCALING TENDENCIES FROM PRODUCED WATERS
 - NON-REVERSIBLE, NON-FOAMING AND NON-EMULSIFYING
 - HIGH TEMPERATURE STABILITY (+150°C)
 - NO REACTANT/BY-PRODUCT PRECIPITATION
 - ENVIRONMENTALLY RESPONSIBLE AND NON-REGULATED REACTANTS

CO-CLEAN

- SIMPLE, SAFE, VERY FAST ACTING, LOW DOSE OXIDIZING CHEMISTRY
- CONVERTS ANY SULPHUR BEARING CONSTITUENTS (H_2S , FeS) INTO SOLUBLE SO_4
- REMOVES IRON AND MANGANESE COMPONENTS
- ZERO INTERFERENCE WITH ASSOCIATED CHEMISTRIES (FRAC/ACID ADDITIVES)
- NO RESIDUAL BY-PRODUCTS OR HARMFUL SEDIMENTS PRODUCED
- WIDE pH RANGE EFFECTIVENESS
- NON-REACTIVE WITH ORGANIC COMPONENTS (HYDROCARBONS, ETC.)
- PENETRATES THROUGH BIOFILM TO REMOVE ANY RESIDUAL BUILDUP
- MAINTAINS RESIDUAL EFFECTIVENESS DOWNHOLE

CO-HIB

- A UNIQUE BLEND OF ANTISCALANT AND CORROSION INHIBITORS DESIGNED TO ELIMINATE AND CONTROL IRON SULPHIDE AND IRON OXIDE SCALES
- AVAILABLE IN SOLID STICK/PELLET OR LIQUID FORM
- COMPATIBLE WITH ACID BASED SYSTEMS
- CAN BE USED IN CONJUNCTION WITH A BATCH OR CONTINUOUS BIOCIDES PROGRAM TO GREATLY REDUCE PRODUCED FLUID H₂S CONTENT

MILLING/DRILLING CHEMISTRIES

- UNIQUE & PROPRIETARY BLENDS OF:
 - FRICTION REDUCERS
 - LUBRICANTS
 - SWEEP GELLANTS
 - FOAMERS
- AVAILABLE IN PAILS, DRUMS, OR TOTES
- CUSTOMIZED LABELLING AND DATA PACKAGES
- ALL 'NON-REGULATED' TDG & DOT CLASSIFICATION

MISCELLANEOUS PRODUCTS

- DEMULSIFIERS
- CLAY CONTROL SUBSTITUTES
- SURFACTANTS

SUMMARY

- PROVIDE SIMPLE, COST EFFECTIVE & PROVEN CHEMICAL SOLUTIONS
- ENSURE 'ENVIRONMENTAL STEWARDSHIP' IS ALWAYS CONSIDERED
- UTILIZE LOCALLY AVAILABLE COMMODITIES, IN-HOUSE BLENDING AND LOGISTICS
- APPLY EXTENSIVE INDUSTRY KNOWLEDGE, RELATIONSHIPS AND EXPERIENCE TO SUPPORT OPERATOR CLIENTELE



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