2-DAY TRAINING COURSE AGENDA

MEMBRANE DESALINATION TECHNOLOGIES *IN PRACTICE*

July 26-27, 2007, Las Vegas, Nevada, USA (Venue to be announced)

By: Eng. Mohamad Amin Saad - MASAR Technologies, Inc., USA

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Thursday, July 26, 2007	
WELCOME & INTRODUCTION	**0900-0915**
I. FEED WATER QUALITY & SOURCES ❖ *Water Chemistry & Characteristics* ❖ *Wells & Open Intakes*	**0915-0945**
II. PRETREATMENT REQUIREMENTS ❖ *Philosophy and Overview* ❖ *Membrane Scaling & Fouling Potential – Sources & Remedies* ❖ *Chemical Pretreatment Types* ➢ *Disinfection – Chlorination, Chloramination & Dechlorination* ➢ *Coagulation & Flocculation - Colloidal Control & Measurement* ➢ *Acidification & Softening* ➢ *Anti-Scale Dosing*	**0945-1045**
REFRESHMENTS BREAK	**1045-1100**
❖ *Filtration Techniques – Filter Bed Types* ➢ *Depth Filtration - Pressure Media & Gravity Filters* ➢ *Activated Carbon Filtration* ➢ *Cartridge (Micron) Filtration* ➢ *Design, Operation & Problems*	**1100-1200**
LUNCH BREAK	**1200-1330**
III. MEMBRANE TECHNOLOGIES OVERVIEW ❖ *Membrane Materials & Configurations* ➢ *Cellulose Acetate & Poly Amide* ➢ *Hollow Fiber & Spiral-Wound* ❖ *Process Applications* ➢ *Reverse Osmosis (RO) & Nanofiltration (NF)* ➢ *Ultrafiltration (UF) & Microfiltration (MF)* ❖ *New trends in Membrane Manufacturing & Layout*	**1330-1500**
REFRESHMENTS BREAK	**1500-1515**
IV. SYSTEM DESIGN OPTIMIZATION ❖ *Recovery Ratio Optimization – The Cost Impact* ❖ *Brine-Staging, Double-Pass & Hybrid Systems* ❖ *UF/MF Design Integration as Pretreatment to RO/NF Systems*	**1515-1600**
OPEN DISCUSSION, QUESTIONS AND FEEDBACK	**1600-1700**

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V. PLANT OPERATION OPTIMIZATION ❖ *Criteria for Membrane Selection – Design Considerations* ❖ *Membrane Additions and Replacements* ❖ *Chemical Cleanings – Action or Reaction?*	**0900-1000**
VI. TROUBLESHOOTING GUIDELINES ❖ *The Seven Golden Rules* ❖ *The Seven Signs of Trouble*	**1000-1030**
REFRESHMENTS BREAK	**1030-1100**
VII. PERFORMANCE MONITORING & EVALUATION ❖ *Data Collection, Monitoring & Reporting* ❖ *ASTM Data Normalization and Trending* ❖ *Real-Time Monitoring & Fouling Detection* ❖ *Silent Alarm™ Early-Warning Technology* ❖ *RO/NF Plant Case Studies*	**1100-1300**
LUNCH BREAK	**1300-1430**
VIII. MEMBRANE FOULING CONTROL STRATEGIES ❖ *Fouling & Scaling Potential & Types* ❖ *Biological Fouling Identification, Prevention & Control* ❖ *Organic Fouling* ❖ *Colloidal & Silica Fouling* ❖ *Fouling Control & Prevention Technologies*	**1430-1545**
REFRESHMENTS BREAK	**1545-1600**
IX. TOP 30 PRACTICAL PLANT GUIDELINES ❖ *Design* ❖ *Operation* ❖ *Maintenance*	**1600-1630**
OPEN DISCUSSION, QUESTIONS AND FEEDBACK **CERTIFICATE AWARDS** **CONCLUSION**	**1630-1700**