

SOLUTION MINING RESEARCH INSTITUTE

**812 MURIEL STREET
WOODSTOCK, ILLINOIS 60098
815-338-8579**

**MEETING
PAPER**



JET LEACHING TECHNOLOGY AS APPLIED TO SALTDOME BOREHOLE UNDERREAMING

**Donald R. Harrington
President**

**Corrosion Management International, Inc. (CMI)
2130 Kaliste Saloom, Suite 312
Lafayette, LA 70508
Phone: (318) 989-5055
Fax: (318) 989-5095**

**Presented at the 1995 Spring Meeting
of the Solution Mining Research Institute
in New Orleans, Louisiana
May 1, 1995**

Author: Donald R. Harrington

Title: President of Corrosion Management International, Inc. (CMI)

ABSTRACT

This invention relates to both a method and the use of a specific apparatus to enlarge a below ground salt dome formation borehole without the use of conventional underreamers. More particularly, this invention relates to a method and apparatus for widening a pilot hole drilled in a salt formation to a desired internal diameter by freshwater saturation of the surrounding salt.

The "Jet Leaching" technology (Patent Pending No. 08/255,415) provides an apparatus and method designed to widen to a desired diameter borehole in a soluble mineral deposit such as a salt dome formation without the use of mechanical drilling or reaming techniques. It is comprised of a freshwater wash Jet Leacher attached to the end of a drill pipe string. The Jet Leacher is equipped with nozzles at its' sides positioned at various angles and sizes to direct the flow of freshwater to the periphery of a borehole.

The freshwater wash tool is introduced into the uncased portion of the wellbore at the end of a drill pipe string and run to the bottom of the borehole. Freshwater is pumped into the drill pipe string at a known

pressure and flow rate and is introduced along the borehole through various configurations and diameter nozzles. This freshwater then dissolves the mineral deposits around the borehole. The mineral saturated water is returned to the surface by pumping it back through the wellbore at a predetermined rate. The saturated water return rate is dependent upon the freshwater solubility rate of the mineral deposit being encountered.

The percent of mineral saturation of the return water pumped out of the borehole is monitored at the surface. The percent of mineral saturation allows determination of the volume of minerals being removed per length of borehole as the drill pipe string and Jet Leacher is removed.

The process of opening the borehole to a desired internal diameter with the utilization of the "Jet Leacher" nozzle selection as the apparatus.

The method will be determined by a computer generated data analysis of:

- a. **Time (Saturation)**
- b. **Volume/Rate of fluid pumped (Injection)**
- c. **Specific gravity of fluid returns**
- d. **Total salt removed**
- e. **Revolutions per minute of the drill pipe**
- f. **Estimated salt removal as compared to actual salt removed**