



US005975798A

United States Patent [19]

[11] Patent Number: **5,975,798**

Liskowitz et al.

[45] Date of Patent: **Nov. 2, 1999**

[54] **IN-SITU DECONTAMINATION OF SUBSURFACE WASTE USING DISTRIBUTED IRON POWDER**

[75] Inventors: **John J. Liskowitz**, Sea Girt, N.J.; **Toshimune Kimura**, Musashino; **Jun Ogata**, Chiba, both of Japan

[73] Assignees: **ARS Technologies, Inc.**, Highland Park, N.J.; **Dowa Mining Co., Ltd.**, Japan

[21] Appl. No.: **08/922,042**

[22] Filed: **Sep. 2, 1997**

[51] Int. Cl.⁶ **A63D 3/00**; B09C 1/08

[52] U.S. Cl. **405/128**; 210/747; 210/757; 588/224; 588/248; 405/263

[58] Field of Search 166/279, 310, 166/371; 210/747, 757, 908, 912, 913; 588/206, 224, 236, 248, 256; 405/128, 263

[56] References Cited

U.S. PATENT DOCUMENTS

4,830,766 5/1989 Gallup et al. 166/310 X

5,318,116	6/1994	Vinegar et al.	405/128 X
5,362,402	11/1994	Haitko et al.	210/757
5,447,639	9/1995	Sivavec	210/747
5,534,154	7/1996	Gillham	210/747 X
5,616,253	4/1997	Fernando et al.	405/128 X
5,730,550	3/1998	Andersland et al.	405/128
5,750,036	5/1998	Sivavec	210/747
5,789,649	8/1998	Batchelor et al.	588/206
5,857,810	1/1999	Cantrell et al.	405/263

Primary Examiner—George Suchfield

[57] ABSTRACT

A method for the in-situ remediation of contaminants including soluble metals more noble than iron and halogenated hydrocarbons that are present in groundwater, absorbed to soil, and exist in the free product state in a soil volume. An inert pressurized gas in combination with an atomized iron powder-water slurry is used to inject pre-determined quantities of reactive zero valent iron powder relative to the quantity of contaminants present in the soil for obtaining preselected rates of remediation with minimum quantities of iron powder and with reaction products within a preferred acidic pH range. Features, such as particle surface area and carbon content, are identified that enhance the reactivity of the iron powder.

5 Claims, 3 Drawing Sheets

