North Carolina State University
School of Engineering

Industrial Extension Service
919/737-2356

P. O. Box 5506
Raleigh, N. C. 27650

May, 1982

Land Treatment Case Study #1

Neuse River Wastewater Treatment Plant
P.O. Box 590 Utility Department
Raleigh, NC 27602
919/779-2010
Contact: Mr. Fred Smith, Soil Scientist

The Neuse River Wastewater Treatment Plant is currently operating a 650 acre land treatment farm as a waste management approach for the liquid sludge which is a by-product of the wastewater treatment process. On a daily basis 30,000 dry pounds of sludge are applied to 3 acres of land. The sludge, which contains Zn, Cu, Pb, Cd, Ni and Ag, as well as other metals in smaller quantities, is not considered hazardous by the N.C. Solid and Hazardous Waste Management since the metal content in the sludge is below the allowable EPA-RCRA levels. Land treatment was selected as a waste management technique since the alternatives, landfilling and incineration, are economically infeasible.

The sludge, full of plant nutrients, is being used as a fertilizer at the land treatment site where various grain crops are grown and harvested for cattle feed. Mr. Smith, Soil Scientist for the treatment site, plans to make the land treatment operation self-sufficient by eventually selling the harvested grain. In addition, Mr. Smith is investigating the possibilities of spreading liquid sludge on local farmlands since the treatment facility will be unable to accommodate the increasing quantities of liquid sludge in the near future.

General guidelines for the operation of the land farm are found in Sludge Treatment and Disposal, a two volume work published by the EPA in October, 1978 (#625-4-78-012). Specific guidelines come from the permit issued by the N.C. Department of Natural Resources, Division of Environmental Management.

Mr. Smith invites interested parties to tour the treatment facility. He prefers groups and asks that you allow two hours for a complete tour.

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Land Treatment Case Study #2

A manufacturer of textile specialties (softeners, emulsifiers, durable press agents, dying assistants, dye carriers, etc.) land treats its waste stream through spray irrigation on 3 to 4 acres of land. Commonly, one acre is utilized per spraying of 2000 to 3000 gallons of waste.

The waste contains non-detectable levels of metals and is not considered a hazardous waste. The exact land area to be used per spraying is determined in part by the solids content of the waste. Therefore, daily analysis of the waste stream is necessary.

Alternatives to land treatment for this waste stream are 1) utilization of a municipal wastewater treatment system or 2) the construction of a private wastewater treatment system; for this particular manufacturer neither of the above alternatives are feasible.

A permit for land treatment of a waste stream was required from the Division of Environmental Management in the North Carolina Department of Natural Resources.

File 11350

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Land Treatment Case Study #3

Carolina Power and Light Company
411 Fayetteville Street
Raleigh, North Carolina 27602
919/836-6045
Contact: Mick Greeson

CP&L had a spill of clean turbine oil at their Brunswick power plant. An absorbent, Oil-Dri, was used to clean up the spill. CP&L is now left with the disposal of 35 barrels (less than 2000 pounds) of Oil-Dri mixed with turbine oil. The environmental section of CP&L decided to utilize land treatment as a disposal method. It was decided that 1000 square feet of land was needed per 8 barrels, or a total of 4000 square feet. Applications of nitrogen and lime would be necessary to enhance bacterial action in the soil. Monitoring efforts would be conducted by observation of cover crops. At present this plan is in the proposal stage since CP&L must first receive an amendment to their present permit from the North Carolina Division of Health Services.