WORKSHOP C

RADWASTE WORKSHOP

John E. Stewart
Werner & Pfleiderer Corp.

This workshop is intended to be a continuation of the one in New Orleans in January 1977. Open and candid discussion is encouraged.

While radwaste includes gas, liquid and solid wastes, the workshop will center on the conditioning of liquid and solid wastes. This includes volume reduction and solidification techniques.

The emphasis on volume reduction is due to several causes, mainly underestimation of wastes actually generated, and increasingly stringent regulations requiring stricter treatment control before release. Since that early period, trends in costs and volumes are escalating.

Figure 1 indicates that the annual volumes shipped from BWR's and PWR's increase the first three years to approximately 55,000 and 40,000 cu. ft., respectively, for a 1 GWe plant.

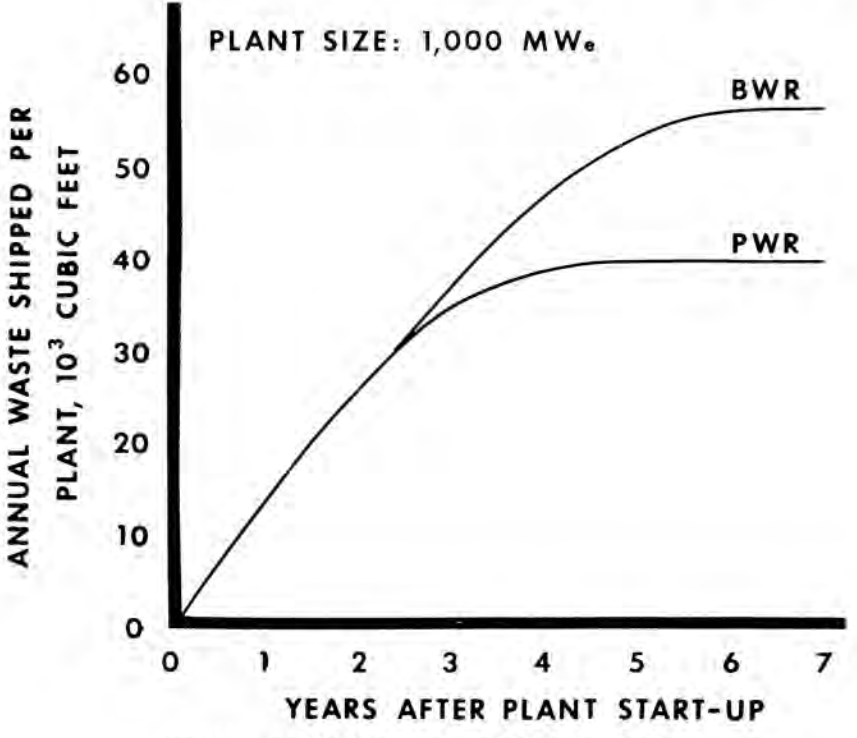
The cost of transporting the wastes to a burial site (Fig. 2) is also increasing. The burial sites are shrinking in number available and the volume of space available.

The chart in Fig. 3 was made when West Valley and Maxey Flats were open. The AIF Report, NESP-008, indicated that burial difficulties would arise by 1980 (Fig. 4). One effect is that burial rates, Fig. 5, have escalated from 80¢ per cubic foot in 1972 to $2.10 in 1978. The accumulated volume will exceed 400 million cu. ft. by the year 2000 unless volume reduction is accomplished.

One may conclude that volume reduction is a serious consideration for utilities today. Europe recognized this fact early due to more limits on burial sites, and started serious programs to treat their effluents.

FIGURE 1

WASTES SHIPPED FROM NUCLEAR POWER PLANTS



BASIS: AIF/NESP–008, OCTOBER, 1976

FIGURE 2

TRANSPORTATION COST PER MILE

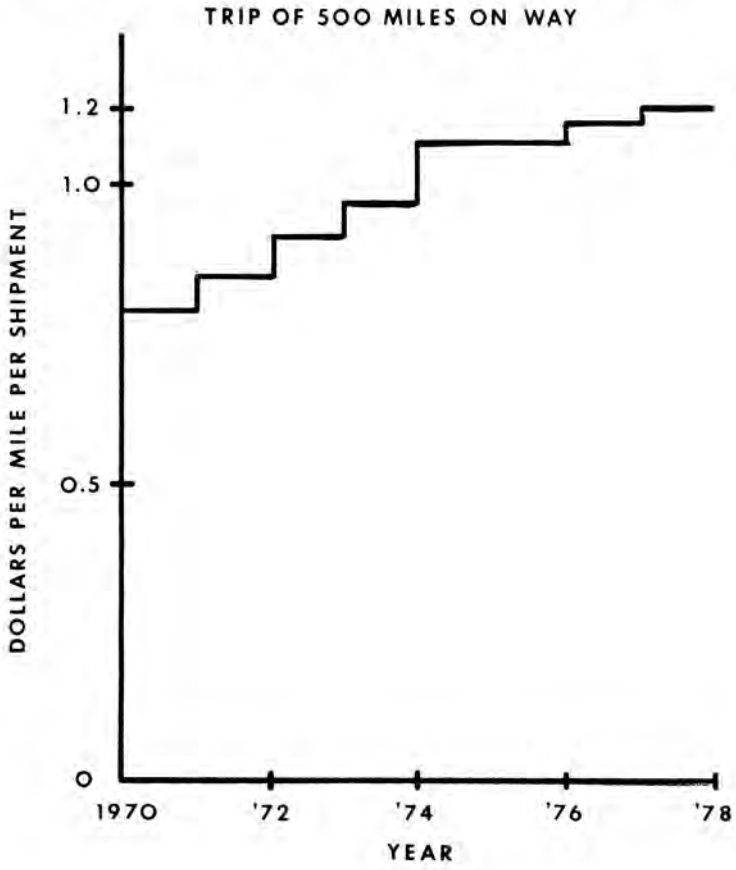


FIGURE 3

COMMERCIAL BURIAL SITE CAPACITY

SITE LOCATION	ACRES * AVAILABLE	BURIAL CAPACITY 10^6 CU. FT.	EXHAUSTION DATE
EASTERN	234	64.4	1986 – 1987
WESTERN	124	34.1	1998 – 2000
COMBINED	358	98.5	1988 – 1990

*ACRES PRESENTLY LICENSED AND SUITABLE FOR BURIAL OF WASTE

FIGURE 4

BURIAL SITES

AIF REPORT NESP-008ES

EXISTING COMMERCIAL BURIAL SITES FILLED TO CAPACITY BY 1988.

BURIAL DIFFICULTIES TO BEGIN BY 1980.

ETSB REVIEW BASED ON LICENSEE SEMI-ANNUAL REPORT DATA

COMMERCIAL BURIAL GROUNDS DISPOSAL CAPACITY TO BE EXHAUSTED BY EARLY 1990's.

WITH 30-40 YEAR PLANT LIFETIMES, WHAT IS THE ANSWER...?

FIGURE 5

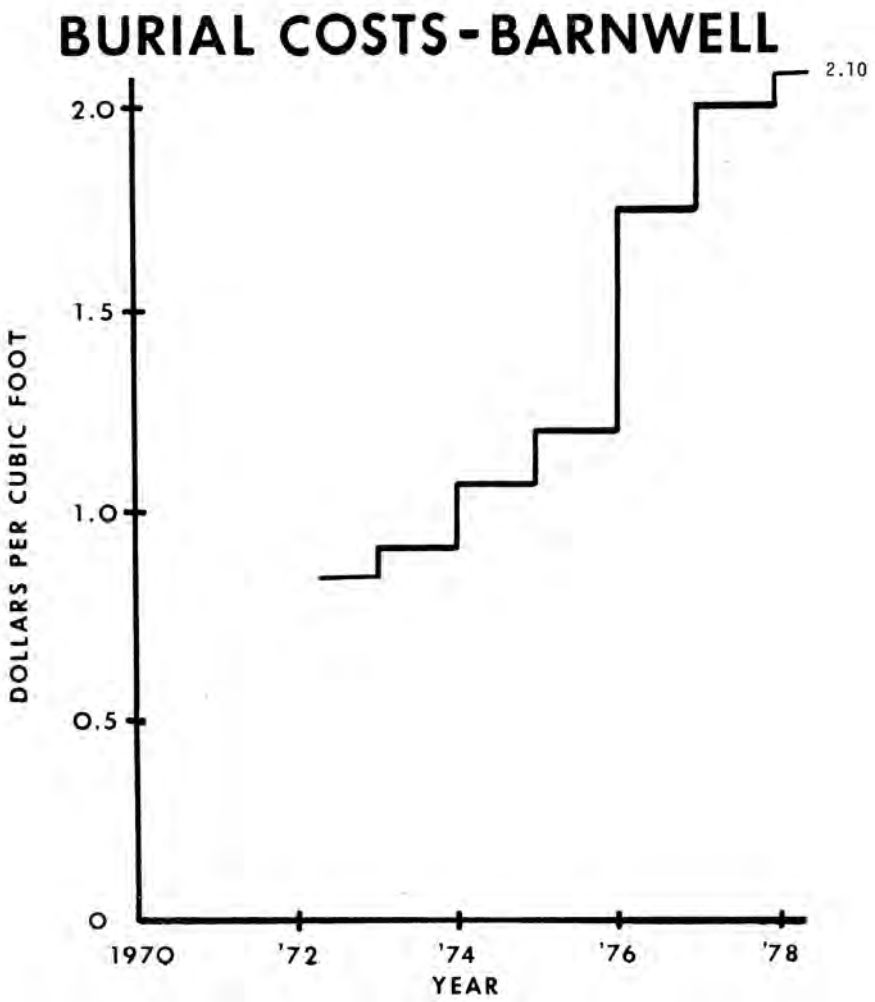
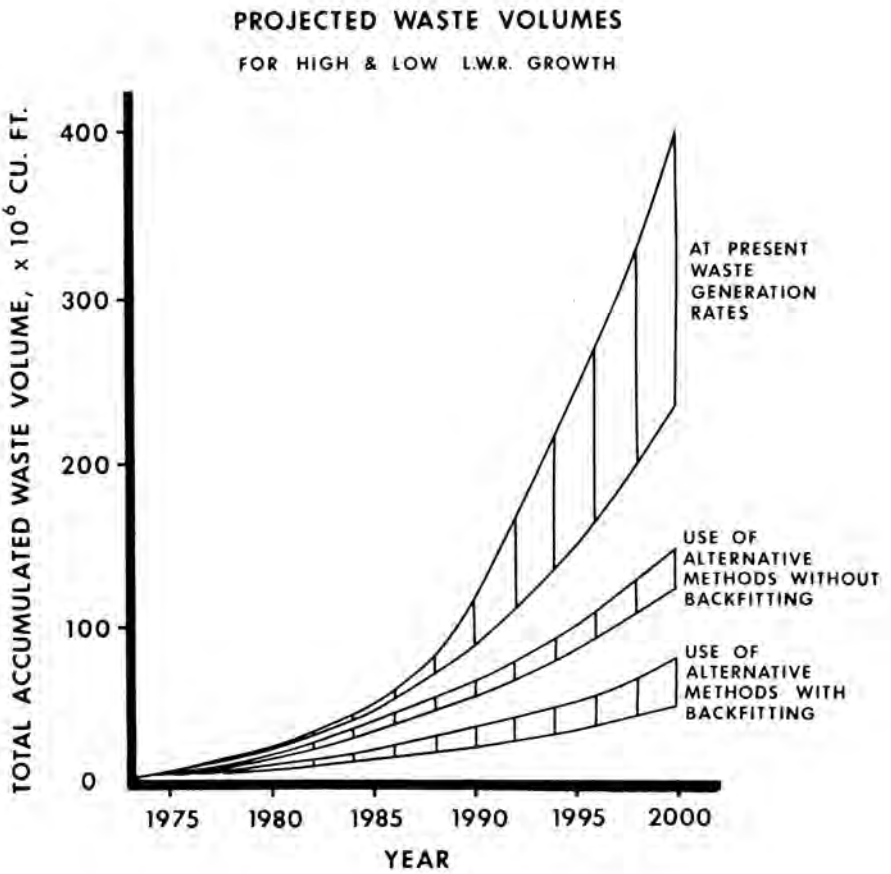

BURIAL COSTS - BARNWELL
2.10
2.0
1.5
1.0
0.5
0
DOLLARS PER CUBIC FOOT
1970
'72
'74
'76
'78
YEAR

FIGURE 6


PROJECTED WASTE VOLUMES
FOR HIGH & LOW L.W.R. GROWTH
TOTAL ACCUMULATED WASTE VOLUME, x 10⁶ CU. FT.
400
300
200
100
0
1975
1980
1985
1990
1995
2000
YEAR
AT PRESENT WASTE GENERATION RATES
USE OF ALTERNATIVE METHODS WITHOUT BACKFITTING
USE OF ALTERNATIVE METHODS WITH BACKFITTING