LIST OF FIGURES

CHAPTER I

MISSISSIPPI

RIVER

Note: U, Th, and Ra daughter products are implied by the term etc.

y - year
d - day
h - hour
m - minute
s - second

$$N_k = \text{no. atoms K}/\ell = \frac{(1.332 \times 10^{2})(1.12205 \times 10^{13})}{(6.93 \times 10^{-1})(1.19 \times 10^{-4})}$$

$$\text{weight of K} = \frac{(N_k)(39.1)}{(6.023 \times 10^{23})} \quad \text{g}$$

$1.76 \times 10^2 \ (0.4)(0.4)(0.2)(1) = 5.632$ cts/12 hours

for 1 pCi of ^{40}K, or 1.176 mg total K. This corresponds to

$$\frac{5.632}{1.176} = 4.79 \text{ cts/12 hrs/mg K},$$

CHAPTER IV

FIGURE 4

Mississippi River Water

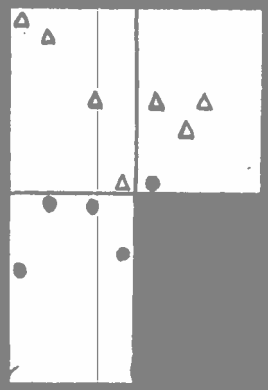
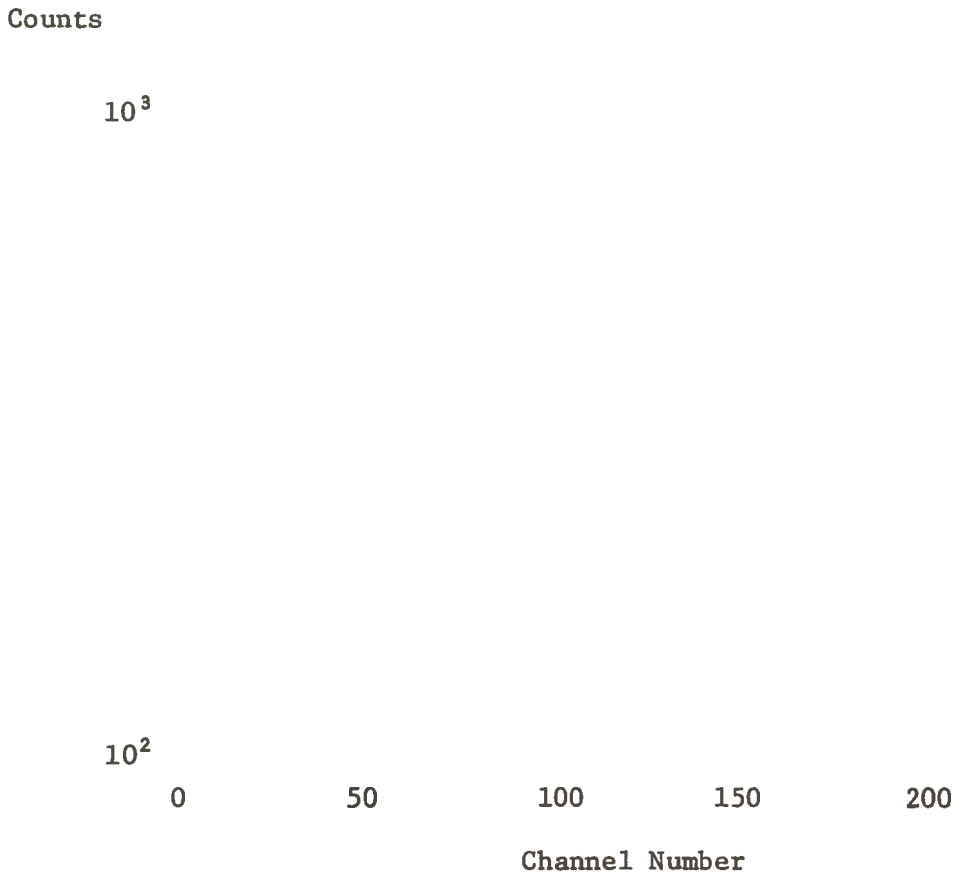


FIGURE 5

Background Count Spectrum, June 11, 1976



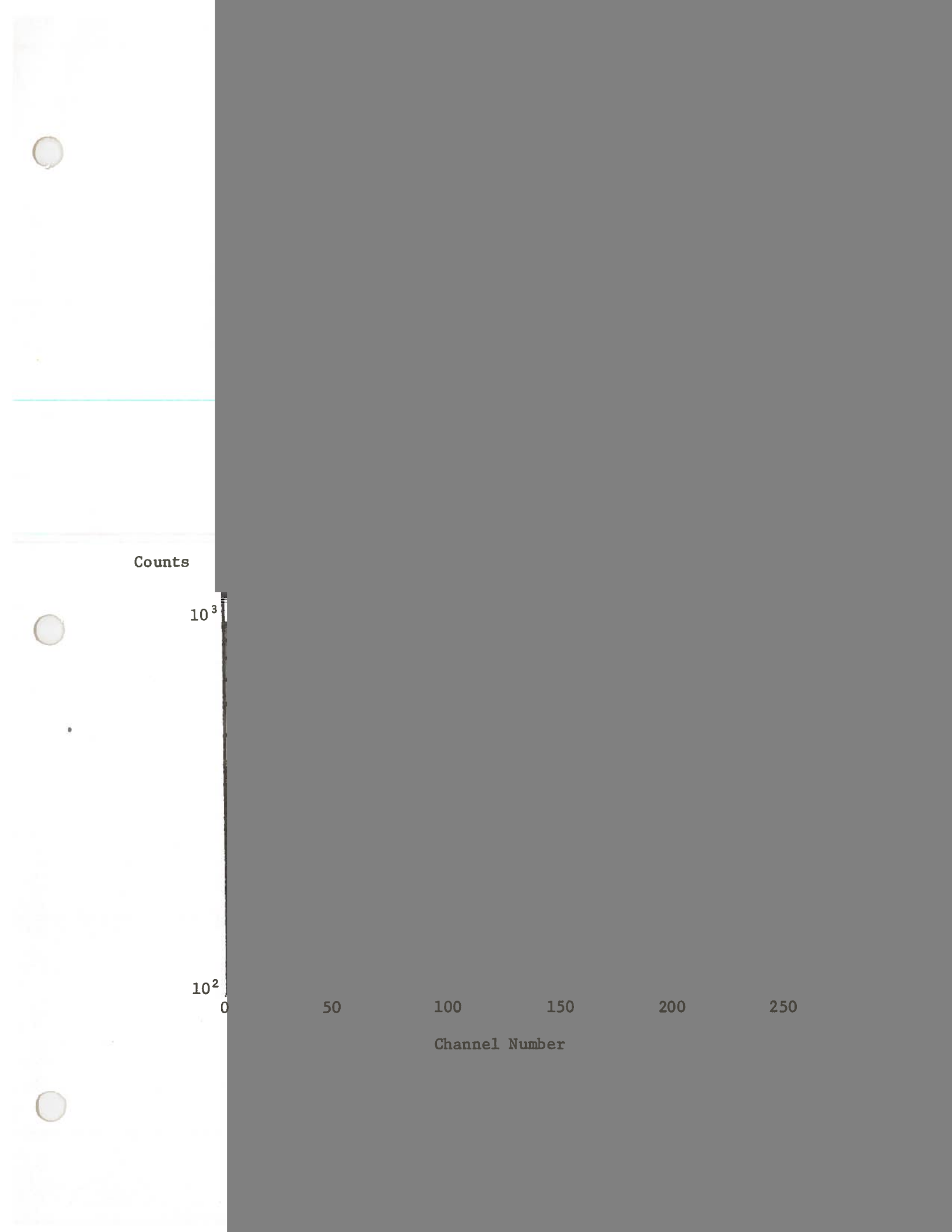

Counts
10^3
10^2
0
50
100
150
200
250
Channel Number

FIGURE 7

Medium Count Sample Spectrum, September 24, 1975

FIGURE 8

Low Count Sample Spectrum, October 1, 1975

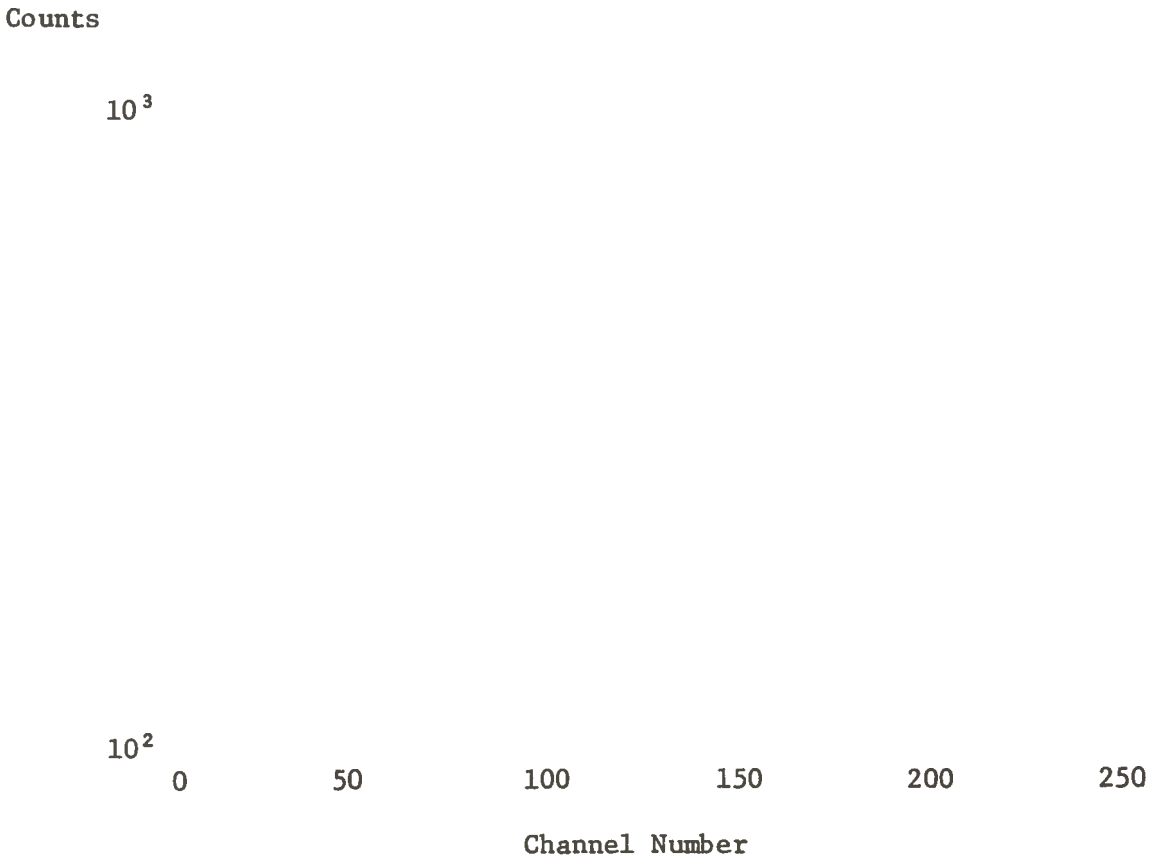


TABLE 5

Quantitative Standards

Element	Compound	Weight of Element	Calculated Activity
Cr	$(NH_4)(r_2O_7)$	1.0 g	10 nCi
Mn	metal	1 mg	31.2 nCi
Na	Na_2SO_4	0.1 g	10 nCi
K	KCl	2.07 g	900 pCi

Element	γ Energy (MeV)	Actual Activity	Net Peak Area Counts
Cr	0.32	10 nCi	3,245
Mn	0.84	27.3 nCi	22,229
	1.81	27.3 nCi	2,760
	2.11	27.3 nCi	1,372
Na	1.37	9.77 nCi	1,953
	2.75	9.77 nCi	1,109
	46	900 pCi	5,658

FIGURE 9

Detector Efficiency vs Gamma Photon Energy