Attachment No. 1

AGRICULTURAL RESEARCH SERVICE
WESTERN REGION

OF UNITED STATES DEPARTMENT OF AGRICULTURE

Engineering Research Center
CSU Foothills Campus
Fort Collins, Colorado 80523

February 17, 1978

Mr. John Horst
HDR, Inc. of Colorado
310 Capital Life Center
Denver, Colorado 80203

Dear Mr. Horst:

During our telephone conversation last Tuesday, I made some estimates of seepage losses to be expected from a 494 acre holding reservoir in the Grand Valley. These estimates were based on basic intake rates of Billings and Ravola soils, the predominant soil types on the tentative disposal site. The estimates of seepage, as you recall, were quite large. Assuming the seepage water caused an equivalent displacement of groundwater to the Colorado River, carrying a salt load equal to the average for Grand Valley groundwater, 4.75 tons/acre-foot, the annual loading of the River would exceed 80,000 tons of salt. The December, 1977 environmental assessment of the Grand Valley Unit by the U. S. Bureau of Reclamation estimates current annual salt loading from the Grand Valley at 650,000-850,000 tons. The improvement program anticipated by USBR and SCS is estimated to reduce this loading by 410,000 tons/year. Each 10,000 tons of salt causes approximately 1 mg/ℓ increase in salinity of the Colorado at Imperial Dam with associated damages to downstream users estimated at $230,000. Thus, an additional salt load on the order of 80,000 tons/year would clearly be unacceptable.

Since Tuesday, I found some measured values of hydraulic conductivity of soils similar to the reservoir site averaging about 0.01 in/hour (from Skogerboe and Walker, Evaluation of Canal Lining for Salinity Control in Grand Valley, EPA-R2-72-047, October, 1972). I reanalyzed the problem, considering that a lens of very low permeability separates the cobble aquifer from the surface soils and that a ground water mound would probably soon build from this layer to the bottom of the reservoir. Losses from the reservoir might thereafter be treated in a manner analogous to seepage losses through a dam. I was surprised to find the resulting estimate of seepage several orders of magnitude lower than my original estimate. The result, in terms of salt loading, would be negligible.

Attachment No. 2

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

P. O. Box 17107, Denver, Colorado

February 21, 1978

Mr. John Horst
Henningson, Durham & Richardson, Inc.
310 Capitol Life Center
Denver, Colorado 80203

Re: Grand Valley Salinity Study

Dear Mr. Horst:

Thank you for calling to discuss your concern for salinity control in the Grand Valley. We have found that groundwater flow is significantly affected by the use and control of water on the ground surface. Groundwater flows contain an average of 4200 ppm salt concentration which contributes the salt load to the river.

In order to reduce the salt load in the river we encourage practices that control seepage in water conveyance and storage structures in the valley.

Also, we are pleased to send a copy of our report titled On-Farm Program for Salinity Control.

M. Earl Hess
Resource Planning Specialist

Enclosure