COLORADO DEPARTMENT OF HEALTH

4210 EAST 11TH AVENUE · DENVER, COLORADO 80220 · PHONE 388-6111

Anthony Robbins, M.D., M.P.A. Executive Director

December 9, 1977

Mr. Karl D. Henrichsen, P.E.
Henningson, Durham & Richardson
310 Capitol Life Center
Denver, Colorado 80203

RE: Report for Expansion of Grand Junction's Wastewater Treatment Works.

Dear Mr. Henrichsen:

As discussed at the December 6, 1977, meeting of the Water Quality Control Commission there are several matters which require further analysis relative to the treatment alternatives for the City of Grand Junction. It will be necessary to investigate these matters to receive the Commission's approval and support.

Generally there are two interrelated topics requiring attention.

1. As stated by Dr. Norman Evans, Professor of Engineering at Colorado State University, Director of the Water Resources Institute and Assistant Director of the Colorado State University Experiment Station, much work has been done on irrigation practices in the Grand Valley Area.

   Demonstration projects have been completed resulting in "progress reports" prepared jointly by the Colorado State Univeristy Experimental Station and the U. S. Department of Agricultural Research Service. These projects have been carried out in the last 4 to 10 years near the regional plant site at H and 24 road.

   The "progress reports" with other work contain engineering design criteria, economic and hydrogeologic studies pertaining to presently irrigated land near the proposed regional plant site. Specifically, the reports delineate:

   A. A low gradient border flood irrigation system with a distribution efficiency equal to or greater than 85%.

   B. Application rates from 3½ inches/week to 7 inches/week for a 5 month period.

   C. Land preparation costs as well as other operating costs.

D. Yields with expected rate of return.

E. No adverse impacts relative to salinity.

This information is available at Colorado State University through Dr. Evans. In addition the following can be contacted relative to the specifics of these projects.

Mr. Dale Heermann, Irrigation Engineer and Mr. Gordon Cruz, Agricultural Research Service, USDA Federal Building, Fort Collins.

In a more general sense Mr. John Keys, Head, Salinity Control Office, Engineering and Research, Bureau of Reclamation, Denver Federal Center can be contacted.

We feel these same people will verify that the use of previously unirrigated land in the location of the Bureau of Land Management land application site will result in an additional major contribution of salt and therefore be unacceptable.

2. It would appear there is little opposition to the City's desire to abandon the existing plant and go with one regional facility. However, investigation into item number one should result in significant changes in alternative number 4 of your amended predesign report. Therefore, the following items must be addressed as they relate to alternative number 4. Another alternative for a regional facility employing aerated lagoons as pretreatment followed by land application will have to be investigated.

   Specifically, as applicable to alternatives number 4, and the additional alternative, the following must be provided with your justification. We prefer the design basis for the processes used and the cost tabulations be based on relevant actual data from the area.

   A. The method of irrigation.

   B. The proposed irrigation rate.

   C. Land required for the land application system, for flows of 12.5 MGD and 7.7 MGD.

   D. Total capital costs (with justification).

      1. Land - dollars/acre based on similar irrigation land near wastewater treatment facilities.

      2. Aerated Lagoon, degree of treatment based on needs of land application system not to meet secondary standards. (See interim division guidance on planning and design review for land application systems by F. Rozich 3/18/77 enclosed).

3. Automated irrigation equipment.

4. Reservoirs.

5. Pumping facilities, pipelines.

6. Field preparation including roads and fencing.

7. Monitoring wells.

8. Administration facilities.

9. Additional costs due to special conditions at the site determined by actual field demonstrations as necessary for adequate performance.

E. Operation and maintenance costs

1. Distribution and application of effluent

   a. Labor
   b. Power
   c. Other, itemize

2. Farming operation

   a. Revenue
   b. Costs

      1. Labor
      2. Power and fuels
      3. Chemicals
      4. Others

For alternative number 5 would you verify that the capital and O & M costs for handling and disposal of sludge from the mechanical plant is incorporated into the cost figures.

A summary format for the three alternatives similar to tables 9 and 10 of your amended predesign report should be provided.

If you have any questions regarding this matter please feel free to contact this office.

Very truly yours,

WATER QUALITY CONTROL DIVISION

Jonathan W. Love, P.E.
Domestic Waste Consultant
Technical Services Section

JWL:emf

cc: City of Grand Junction
Dick Bowman, District Engineer
Ken Webb, Planning
Mrs. Ruth Wright
Dr. Evans