Date: February 11, 1994

To: File

From: Dick Bowman

Subject: Valle Vista Sewer Line - Mesa County

A lagoon system to serve the Valle Vista Subdivision was approved as a temporary system by the Water Quality Control Commission on June 1, 1976 (see attached approval letter and supporting documentation in Attachment A). From 1976 to the present, the West Slope Field Office of the Colorado Department of Health Water Quality Control Division has received numerous complaints concerning odors and illegal discharges. This office could never document any violations until 1990. On April 5, 1990, Dwain Watson (CDH) notified the Valle Vista homeowners of an illegal discharge (see Attachment B). From April 1990 to May of 1991, there was much controversy and discussion as to ownership of the Valle Vista sewer facility and who is responsible for correcting the problem.

On May 16, 1991, the Mesa County Commissioners authorized Del-Mont Consultants Incorporated to complete a feasibility study of the Valle Vista sewer problem. This feasibility study recommended that the best long term solution was to connect the Valle Vista Subdivision to the Orchard Mesa Sanitation District collection facilities.

On April 1, 1992, the State of Colorado awarded an advance of allowance for Planning and Design to Orchard Mesa Sanitation District through Mesa County to amend the 201 Plan to include the Valle Vista Subdivision.

The Orchard Mesa Sanitation District chose McLaughlin Water Engineers to complete the 201 Plan. McLaughlin Engineers studied the following five alternatives:
1.   Upgrade the existing Valle Vista Wastewater Treatment Plant
2.   Gravity sewer - B Road
3.   Gravity sewer - A½ Road
4.   Lift Station at Valle Vista
5.   Gravity sewer with lift station

The report states that considering only initial construction cost, upgrading the Valle Vista Wastewater Treatment Plant is the most cost effective. However, when you consider initial construction cost plus annual operation and maintenance cost, the two gravity sewer line options are the most cost effective solutions over a twenty year (20 year) project life. It should be noted that the irrigation company, owning the ditch adjacent to the Valle Vista Wastewater Treatment Plant, would not allow treated effluent to be discharged into the irrigation ditch. In conversations with McLaughlin Engineers, they stated it was their belief that there was not adequate land area below the existing Valle Vista Wastewater Treatment Plant to make the Valle Vista plant totally nondischarging. Land is available at Valle Vista if the treated effluent is pumped to a remote area. This cost was not included in the report.

When reviewing the environmental impacts for this project, the original 201 plan, the original study area, the existing service area, and the Negative Declaration and Amended Negative Declaration were reviewed. In some of the early discussions with the Valley Wide Sewer Committee, I remembered discussions to include the

Valle Vista area in the original 201 Planning Area. Unfortunately, many documentation supporting this has been loaned out and never returned. Since this project is a minor extension to the 201 service area with the same or similar environmental conditions, it was assumed that there would be no further environmental impact and that we could extrapolate information from the original Negative Declaration and Amended Negative Declaration. It was further assumed that since this was a non-equivalency project, only comments through the State clearing house were necessary. The EPA felt additional documentation was necessary and required the State to obtain written comments from the Corps of Engineers, Soil Conservation Service, U.S. Fish and Wildlife Service, the Colorado State Historical Society and the Colorado Division of Wildlife. The comments from the above listed agencies confirmed our assumptions that there would be no adverse impacts connected with a sewer line extension to the Valle Vista Subdivision (see Attachment C).

The McLaughlin Engineering report listed the alternatives B-2 (gravity sewer along A½ Road) and B-1 (gravity sewer along B Road) as the most cost effective and feasible. The difference in construction cost between B-2 and B-1 is $500.00. For estimating purposes, the two alternatives are the same. The engineering report was leaning more toward alternative B-2 because this route had a few more houses on ISDS systems and was closer to Highway 50 than alternative B-1. The disadvantage of alternate B-2 is that there is currently no utility easements and more pavement replacement costs connected are to this alternative versus alternative B-1.

The engineering report recommended that if either alternative B-2 or alternative B-1 were selected, the other alternative remain a viable alternative until the final design phase was completed (see Attachment D). In preparing the Finding of No Significant Impact, it was decided that based on the engineering report, alternative B-2 would be listed as the alternative but B-1 would remain viable until a more detailed cost analysis could be completed. This would insure the most cost effective alternative would be chosen while allowing flexibility to the project. The rationale used in the final decision making process for the sewer line route was outlined in an October 26, 1993 letter to James L. Shanks, City of Grand Junction, from Larry B. Beckner, Counsel for Orchard Mesa (see Attachment E). The letter states the B Road route was more favorable for the following reasons:

1. The ground water table along the B Road route is lower than along the A½ Road route.
2. The property owners along the B Road route are more willing to negotiate easements than along the A½ Road route.
3. There would be less asphalt replacement along the B Road route than the A½ Road route.
4. There are deeper cuts required along the A½ Road route than the B Road route.
5. A detailed engineers cost estimate listed A½ Road $557,927.00 and B Road $486,072.00 (see Attachment F).

The project currently consists of 12,977 feet of gravity sewer line, 1600 feet of this sewer line is 10 inch line, the rest is 8 inch line as required by State design criteria. Attached are Westwater Engineering Velocity Calculations for the Valle Vista Subdivision connection. The assumptions for flow from Valle Vista are 0.033 MGD Average Daily Flow and 0.0725 MGD Peak Daily Flow. Based on this flow data, the velocity in the 10 inch line on a 0.20% grade is 1.12 feet/second for the Average Daily Flow and 1.35 feet/second for the Peak Daily Flow. The velocity in the 8 inch line on a 0.55% grade is 1.60 feet/second for the Average Flow and 1.98 feet/second for the Peak Flow from Valle Vista. The State Design Criteria (sec. 2.43) states:

> "To prevent deposition of solids, all sewers should be so designed and constructed as to transport average sewage flows at mean velocities of 2.0 feet per second, based on a reasonable formulation and roughness factor. The slope between manholes must be uniform. Where the above design would

not be practical due to low tributary population, as would often be the case with laterals and sub-mains, 8-inch sewers must be installed at a slope of at least 0.4%"

The 10 inch line designed on a 0.20% slope was an attempt to maintain a velocity of 2 feet/second for the flows from Valle Vista. To further insure there will not be solids deposition, we requested Orchard Mesa Sanitation District to increase the maintenance on this interceptor (see Orchard Mesa Sanitation District response dated January 24, 1994).

It is a State Site Application requirement for the owner of the receiving wastewater treatment facility to certify that there is adequate capacity to treat the additional flows from the proposed interceptor. We received comments from both, Mesa County and the City of Grand Junction (see Attachment G).

In summary, the gravity sewer lines along B Road is the most cost effective solution to eliminate a health hazard and an illegal discharge at the Valle Vista Wastewater Treatment Plant. It should be noted that Local Affairs has restricted any taps other than Valle Vista from connecting to this line until the Mesa County Commissioners have developed and adopted a land use plan for the Orchard Mesa area.

Valle Vista Interceptor

Design Criteria

1. INITIAL FLOWS: 0.033 MGD AVE. (McLaughlin
                    0.0725 MGD PEAK (WESTWATER
                                Q MONITORIN

2. MIN. 10"ϕ @ 0.20%

$$Q_F = A V_F = \pi/4 \, (0.83)^2 \, (1.49/.009)(0.83/4)^{2/3} \sqrt{0.002}$$
$$= 1.40 \text{ CFS } (0.905 \text{ MGD})$$
$$V_F = 2.60 \text{ FPS}$$

AVE. DAY $q/Q = 0.033/0.905 = 0.04$
$$v/V = 0.43$$
$$\underline{v = 1.12 \text{ FPS}}$$

PEAK DAY $q/Q = 0.0725/0.905 = 0.08$
$$v/V = 0.52$$
$$\underline{v = 1.35 \text{ FPS}}$$

3. MIN. 8"ϕ @ 0.55%

$$Q_F = (\pi/4)(0.67)^2 \, (1.49/.009)(.67/4)^{2/3} \sqrt{0.0055}$$
$$= 1.32 \text{ CFS } (0.850 \text{ MGD})$$

$C2$

AVE. DAY $d/Q = {}^{0.033}/_{0.850} = 0.04$

$v/V = 0.43$

$\underline{v = 1.60 \text{ FPS}}$

PEAK DAY $d/Q = {}^{0.0725}/_{0.850} = 0.09$

$v/V = 0.53$

$\underline{v = 1.98 \text{ FPS}}$