DATA ENTERED	DATE 1	INITIALS 2

DATE RECEIVED	FACILITY NAME	COUNTY NO.	PROGRAM AREA CODE	FACILITY TYPE CODE	SUBJECT AREA CODE
3 3/13/87	4 Risen Son Christian Village Council Bluffs, Iowa	5 78	6 CP	7 C04	8 None at present - suggest adding Clarifier Settling Rate

RULE REFERENCE	DESIGN STANDARD REFERENCE	DECISION / DATE	APPEAL ACTION / DATE
9 567-64.2(9)	10 16.3.2	11 Approved 3-23-87	12

ENGINEER	VARIANCE RULE
13 Jensen, Cary, Shoff	14 567-64.2(9) c

COPY

15. DESCRIPTION OF VARIANCE REQUESTED:

Final settling is to be accomplished within a modular unit manufactured under the trade name "Aero-Mod". These units utilize tube settler technology. The surface settling rate on the tube settlers based on the average wet weather flow (AWW) used in the design of the wastewater treatment facility will be 526 gallons per day per square foot in lieu of the maximum hydraulic loading of 400 gallons per day per square foot required by DNR design standards. The configuration of the tube settler chamber does not utilize conventional weirs for effluent collection.

16. ENGINEERS JUSTIFICATION: The "Aero-Mod" plant design utilizes a tube settler module rather than the conventional hopper tank clarifier. The present DNR design standards do not address tube settler design. Circumstances warranting this variance request include utilization of new equipment technology not explicitly covered by current standards, application of established and acceptable technologies in an innovative manner not covered by current standards, and in applicability of current design standards all as indicated under DNR subrule 64.2 (9)e. The outlet design includes orifice weir surge control to limit plant effluent to 125% of AWW flow and also provides 6 inches of tank depth for flow equalization to absorb diurnal peaks. The outlet flow rate is restricted by a circular orifice plate. These design features allow the "Aero-Mod" unit to adequately handle PHWW flow situations. Info on "Inclined-Tube Settlers" and operation features of the "Aero-Mod" facility submitted.

17. DEPARTMENTS JUSTIFICATION: The "Aero-Mod" facility appears to satisfy innovative technology criteria for EPA funded construction grants projects and has been approved for use by the EPA for the City of Norwood, Missouri and the City of Atalissa, Iowa. The state of Missouri DNR personnel are generally positive towards the process having seen satisfactory results from multiple facilities used at recreational areas in the St. Louis area. The surface settling rate as proposed is within the rate shown by the attached text on "Inclined-Tube Settlers" when applied to tube settlers in conventional clarifier design.

18. PRECEDENTS USED: City of Atalissa, approved 3/5/87

19. STAFF REVIEWER: Fred M. Evans

20. SUPERVISOR: Larry Haage approved 3/24/87

21. AUTHORIZED BY: Daniel McAlister 3/28/87

JCS JENSEN CARY SHOFF CONSULTING ENGINEERS, INC.
Civil • Environmental • Transportation • Structural • Land Surveying

March 12, 1987

Mr. Fred Evans
Wastewater Permits Section
Department of Natural Resources
900 East Grand
Des Moines, Iowa 50319

SUBJECT: WASTEWATER TREATMENT PLANT
RISEN SON CHRISTIAN VILLAGE
COUNCIL BLUFFS, IOWA

Dear Mr. Evans:

This is in response to our phone conversation on March 10, 1987 with regard to plan review on the above project.

We will revise the clarifier depth on the Davco and S&L alternates to require 12 feet sidewater depth per DNR design standards plus 12 inches freeboard. The revised plan sheets will be forwarded under separate cover with Addendum No. One.

As discussed, we request a variance for both the clarifier sidewater depth and surface settling rate design standard on the Aero-Mod plant alternate. The Aero-Mod plant design utilizes a tube settler module rather than the conventional hopper tank clarifier. The present DNR design standards do not address tube settler design. Circumstances warranting this variance request include utilization of new equipment technology not explicitly covered by current design standards, application of established and acceptable technologies in an innovative manner not covered by current standards and in applicability of current design standards all as indicated under your department subrule 64.2(9) paragraph e.

The plan view surface area of the tube settler chamber is 47.5 square feet per 25,000 gpd tank module which equates to 526 gpd/SF surface settling rate based on average wet weather flow (AWW). This is in excess of the design standard 400 gpd/SF required by Section 16.3.2.4.2 for extended aeration activated sludge under conventional design. Because the tube settlers are inclined and eliminate short circuiting, this difference is compensated for with the Aero-Mod. With regard to peak hourly wet weather (PHWW) flow design parameter of 1,000 gpd/SF, the Aero-

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Mod calculates 2105 gpd/SF. The outlet design includes orifice weir surge control to limit plant effluent to 125% of AWW flow and also provides 6 inches of tank depth for flow equalization to absorb diurnal peaks. In addition, the outlet flow rate is restricted by a circular orifice weir. The collection system served by this plant is new and excessive infiltration/inflow will not influence plant loads. In our opinion, these design features allow the Aero-Mod unit to adequately handle PHWW flow situations.

Please review the attached information relative to sidewater depth variance. The design standard requires 12 feet of sidewater depth for clarifier design. According to the manufacturer, the settler tubes reduce the requirement for this depth. See the attached information given under sludge return, clarifier residence time, state-of-the-art clarification, etc.

From the information we have been exposed to, the Aero-Mod alternate appears to be a viable and cost effective method of treating wastewater. The concrete tankage offered as an integral part of this system has the advantage of longer design life and should require less maintenance than steel tank designs.

It is our understanding that DNR is currently considering or has already approved variance applications on Aero-Mod package plants for two other communities in Iowa as innovative designs. A number of plants exist in area states as indicated on the installation list attached.

For these reasons, we request the DNR approve this request for variance on the Aero-Mod system. We also request that your department approve plans and specifications for the Davco and S&L plant as soon as possible. We would appreciate issuance of a construction permit prior to the project letting scheduled on March 23, 1987. Should you have further questions or comments, please let us know.

Very truly yours,

JENSEN CARY SHOFF CONSULTING ENGINEERS, INC.

Richard L. Buenger, P.E.

attachment