DATA ENTERED	DATE	INITIALS
	1	2

DATE RECEIVED	FACILITY NAME	COUNTY NO.	PROGRAM AREA CODE	FACILITY TYPE CODE	SUBJECT AREA CODE
3/13/87	4 Risen Son Christian Village Council Bluffs Iowa	5 78	6 CP	7 C04	8 325

RULE REFERENCE	DESIGN STANDARD REFERENCE	DECISION / DATE	APPEAL ACTION / DATE
9 567--64.2(9)	10 16.3.1	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:

Modular settling unit (Aero-Mod) proposed as an alternate package type wastewater treatment facility utilizes a depth of 6 feet for the clarifier in lieu of the minimum depth of 12 feet required by the design standards for final clarifiers following activated sludge processes.

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 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 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 "Aero-Mod Designs and Disciplines" and installation locations submitted.

17. DEPARTMENTS JUSTIFICATION: The S.W.D. requirements of the design standards are assumed to be related to the fact that the floc following extended aeration periods is very light and has a potential to become re-suspended as a result of normal flow variations. The physical configuration of the settler unit tends to be less sensitive to these variations, as text book values of surface settling rates may be several times greater than those for convential units, while accomplishing effective settling. It does not appear that this design should require the additional depth of water to hold the sludge blanket, as is the apparent guiding rationale behind the design standard depth, as a means of compensating for flow variation.

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

19. STAFF REVIEWER: Fred M. Evans

20. SUPERVISOR: Larry Haage approve 3/20/87

21. AUTHORIZED BY: Daniel D. Olivite 3/23/87

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