

VARIANCE REQUEST

Iowa Department of Natural Resources

1. Date: March 12, 2007 2. Review Engineer: Satya Chennupati 3. Date Received: December 12, 2006 4. County Number: 21 (Clay) 5. Facility Name: City of Dickens 6. Program Area: CP (Wastewater) 7. Facility Type: CO5 8. Subject Area: 350, number of lagoon cells 9. Rule Reference: 507-64.2(9)a 10. Design Stds Ref: 18C.5.1 11. Consulting Engr: DGR & Associates 12. Variance Rule: 507-64.2(9)c	13. Decision: <i>approved</i> Date: <i>3/19/07</i> 14. Appeal: Date:
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15. Description of Variance Request:

The City of Dickens requested a variance from the design standard which requires a minimum of three cells for all controlled discharge lagoon facilities greater than one acre total surface areas. The City is proposing a two-cell lagoon even though the total surface area is approximately 4-acres.

16. Consulting Engineer's Justifications

Equivalent effectiveness. Reduced project costs due to reduction in number of structures, piping, and embankments.

17. Department's Justifications

Recommend variance approval.

A letter from this department on March 8, 1995 stated "This Department will approve two cells as a value engineering concept for most of these unsewered communities." Departmental approval is recommended since this project is for an unsewered community that will be owned and operated by the Iowa Lakes Regional Water. Two-cell lagoon for surface areas larger than 1-acre is one of variance approved. No problems have been reported for previously approved projects.

18. Precedents Used

Previous small community pilot projects from Rural Water Association Small Community Wastewater Pilot Projects for smaller systems. Tingley, Arispe, Floris, Persia, Cromwell.

19. Staff Reviewer: <i>Satya Chennupati</i> 20. Supervisor: <i>[Signature]</i> 21. Authorized by: <i>[Signature]</i>	Date: <i>3/13/07</i> Date: Date: <i>3/19/07</i>
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CHESTER J. CULVER, GOVERNOR
PATTY JUDGE, LT. GOVERNOR

STATE OF IOWA

DEPARTMENT OF NATURAL RESOURCES
RICHARD A. LEOPOLD, DIRECTOR

March 13, 2007

Mr. Randy Van Dyke
Iowa Lakes Regional Water
1301 38th Avenue West
Spencer, IA 51301

Subj: DNR Response to Variance Requests
RE: Wastewater Facilities, Dickens, IA Project No. S2006-0130

Dear Mr. Van Dyke:

The Department has received a request for several variances from the Iowa Wastewater Facilities Design Standards from your Engineer in a letter dated December 12, 2006. This letter transmits the Department's responses to the variance request for the above referenced project. The responses are grouped in the same order as the request.

- A. Design Standard 18C.5.1 – request variance to allow a two-cell controlled discharge lagoon with approximately 4 acres of total surface area.

The above variance is approved in accordance with the Small Community Pilot Project concept as providing equivalent effectiveness.

- B. Design Standard 18C.7.4.4 – request variance to allow installation of influent lines at or above the elevation of the pond seal; influent lines will be installed with a splash block at the end.

The above variance is approved based on the small community pilot project concept as providing equivalent effectiveness for the small system with the following conditions:

- a. Ductile iron influent piping shall be used.
- b. The influent discharge lines shall rest on a suitable concrete apron which is large enough such that the terminal influent velocity at the end of the apron does not cause soil erosion as required by the Iowa Wastewater Facilities Design Standards 18C.7.4.6. The apron must have a lip or baffle at the opposite end of the discharge point.
- c. Adequate measures must be taken to ensure that the line is properly/securely anchored.

Mr. Randy Van Dyke
Iowa Lakes Regional Water
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- C. Design Standard 18C.7.4.5 – request variance to terminate the point of discharge of the lagoon influent line at 2/3 of the distance away from the outlet structure.

The above variance is **denied** based on the fact that the proposal does not provide equivalent or improved effectiveness in comparison to meeting the design standard.

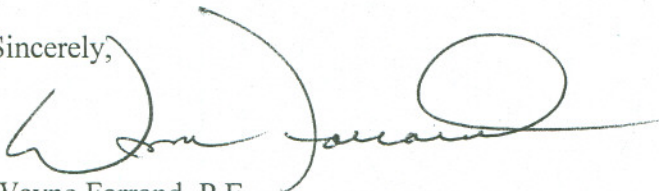
- D. Design Standard 18C.7.4.6 – request variance to eliminate saucer –shaped depressions at the discharge point of the influent piping for primary and secondary cells.

The above variance is **approved** based on the small community pilot project concept as providing equivalent effectiveness for the small system with the following **conditions**:

- a. The influent discharge lines shall be ductile iron and rest on a suitable concrete apron which is large enough such that the terminal influent velocity at the end of the apron does not cause soil erosion as required by the Iowa Wastewater Facilities Design Standards 18C.7.4.6.

If you have any questions, please call Satya Chennupati, P.E. at 515-281-8995.

Sincerely,

A handwritten signature in black ink, appearing to read 'Wayne Farrand', with a large, stylized loop at the end.

Wayne Farrand, P.E.
Wastewater Construction Section Supervisor

Cc: DGR & Associates Company – Rock Rapids, IA
IDNR Field Office #3 – Tom Roos
IDNR Sewage File 6-21-09-0-01



DeWild Grant Reckert and Associates Company
Consulting Engineers

1302 South Union Street
P.O. Box 511
Rock Rapids, IA 51246
[712] 472-2531
Fax [712] 472-2710

December 12, 2006

Satya Chennupati
Iowa Department of Natural Resources
Wastewater Section
Henry A. Wallace Building
502 E. 9th St.
Des Moines, IA 50319

**RE: Iowa Lakes Regional Water
Wastewater Facilities
Dickens, Iowa
DGR Project No. 800552**

Dear Satya:

This letter is to detail the design variances required for the above referenced project. This treatment system provides two main benefits versus traditional three cell lagoon systems namely:

1. A reduction in embankment, piping and valve costs while achieving equivalent effectiveness.
2. Improved effectiveness in the dispersement of settled solids across the pond bottom.

Variance requests are as follows:

1. **Chp 18C.5.1 - requirement for three cells.**
The controlled discharge facility proposed pond is designed with two cells. This reduces the cost of the project by reducing the number of structures, piping, and embankments.
2. **Chp 18C.7.4.4 - requirement for location of influent lines.**
Influent lines are proposed to be located along the bottom of the pond so that the bottom of the pipe is just above the pond seal. This results in a more uniform pond seal due to ease of construction and testing.
3. **Chp 18C.7.4.5 - requirement for point of discharge of influent line.**
Ten States standards recommends that the discharge location be at the midpoint of the width and approximately 2/3 of the distance away from the outlet structure to minimize short-circuiting.

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4. **Chp 18C.7.4.6 - requirement for influent discharge apron.**

The influent line is designed to discharge horizontally onto a concrete apron which is sized so that the velocity of influent will not cause soil erosion. The top of the concrete apron will be the same elevation as the top of the pond seal. The elimination of the pond inlet depression will result in a greater distribution of solids and a higher quality pond liner due to having less transitions and changes in liner location. Sludge accumulations are easier to remove from a flat pond bottom rather than having a depression with varying pond surfaces.

The system designed will achieve the system goals in regards to detention time, erosion control around the influent lines, and dispersion of solids while reducing construction costs. Please review the above at your earliest convenience and contact the undersigned if you have any questions.

Sincerely,

DEWILD GRANT RECKERT
& ASSOCIATES COMPANY



Michael J. Carr, P.E.

MJC:aed

cc: Kelly Whitacre, ILRW