Variance File
18C.5.1
2-cells. CO.

✓ 9-14-06

VARIANCE REQUEST

Iowa Department of Natural Resources

1.	Date:	January 5, 2005	13.	**Decision:**	approved
2.	Review Engineer:	Satya Chennupati		Date:	1/5/05
3.	Date Received:	December 15, 2004			
4.	County Number:	76 (Pocahontas)	14.	**Appeal:**	
5.	Facility Name:	Palmer		Date:	
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:	McClure Engineering Co.			
12.	Variance Rule:	507-64.2(9)c			

15. Description of Variance Request:

The city of Palmer requests a variance from the design standard which requires a minimum of three cells for all wastewater treatment lagoon facilities that are greater than one acre total surface area. The city is proposing a two-cell lagoon even though total surface area is approximately 2.97 acres.

16. Consulting Engineer's Justifications

Chapter 18C.1.2 indicates variances may be granted in this situation where treatment provides "at least equivalent effectiveness while significantly reducing costs." The total surface area of the lagoon is 2.97 AC (2.16 AC in primary and 0.45 AC in each secondary) and the same surface area will be provided with a 2-cell design. This design will save construction costs, and improve the ability of USDA-RD and the City to complete the project while providing a consistent level of treatment effectiveness. Estimated cost savings is $22,250 based on riprap and excavation.

The 2-cell lagoon will provide same treatment capacity including hydraulic capacity and BOD loading. The hydraulic capacity will provide for 180 days of storage with 60 days of storage in the secondary cell as opposed to 2 secondary cells with 30 days storage each. The BOD loading on the primary cell will be 16.6 lb BOD_5/AC/day and the BOD loading on the secondary cell will be the same as if it were two separate cells. In the event maintenance is needed on the primary cell, influent can be rerouted to the secondary cell.

The Engineer has completed several 2-cell lagoons for Rural water franchised utilities. Their experience is that 2-cells provide equivalent effectiveness in complying with effluent limitations. It is their understanding that 2-cells falls under the pilot program for franchised utilities, however two cities in a similar situation to Palmer have been granted variances to construct 2-cell lagoons (Riverton: 333 pop; Silver City: 252 pop). The city of is an unsewered community funded by USDA-Rural Development (USDA-RD). This Department has approved several variance from our design standards to the Small Community Wastewater Pilot Projects. Two-cell lagoon for surface areas larger than 1 acres is one of variance approved.

17. Department's Justifications

Recommend Approval.

The city of Palmer is currently a small unsewered community with a population of 214. The proposed project to sewer the community and build a 2-cell controlled discharge lagoon is funded by USDA-RD. This

Department has approved several variance from our design standards to the Small Community Wastewater Pilot Projects. Two-cell lagoon for surface areas larger than 1 acres is one of variance approved. A letter from this department on March 8, 1995 stated "This Department will approve two cell as a value engineering concept for most of these unsewered communities." This project does not technically qualify as a Pilot Project. However, since the advent of the Pilot Program in 1995, the experience the Department has with the past several projects has been that adequately designed 2-cell lagoons provide at least equivalent treatment effectiveness as 3-cells without any problems to date.

The proposed design organic loadings on the 2-cells are under the allowable loadings for 3-cell lagoons and hydraulic loading is for a 180-day storage meeting the controlled discharge lagoon criteria with provisions to route flow to secondary cell if the primary cell is out of service.

18. Precedents Used
Riverton-2003, Silver City-2004

19. Staff Reviewer: Satya Chennupati Date: 1/5/05
20. Supervisor: Date:
21. Authorized by: Date: 1/5/05

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December 15, 2004

Mr. Satya Chennupati
Iowa Dept. of Natural Resources
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319

RE: Wastewater Disposal Improvements
Palmer, Iowa

Dear Satya:

Per our recent conversations, I have made a few minor changes and I am requesting the following variances on behalf of the City of Palmer.

Collection System:

1. Chapter 12.5.3: Request to allow a minimum slope of 0.5% on all 6" diameter mains with exception of those discussed later in this letter with requested slopes of 0.34% for 6" and 0.22% for 8". These mains are shown on drawing SA-01. Estimated cost savings in surface replacement only is $900. Additional savings would be realized in trenching depth for the pipe.

2. Chapter 12.5.7.1.d: Request to increase manhole spacing in three locations to greater than 400'. These areas have been identified on Sheet SA-01 and show the manhole spacing to be 463', 402', and 422'. In all situations the sewer main must be located at the proposed distance for services and an additional manhole is a construction cost that can be avoided if proper cleaning equipment is available.

   Chapter 12.5.7.1.d. indicates it is acceptable to increase manhole spacing to 500' when adequate cleaning equipment is available. The attached letters state the City's ability to clean the manholes spaced at up to 500' by using T&L cleaning in Fort Dodge. Further documentation is provided from T&L Cleaning verifying their ability to clean sewers with manhole spacing of 500'. Estimated cost savings is $6,000.

3. Chapter 12.5.3.b: Request two sewer main runs be designed at grades of 0.34% and 0.22% for 6" and 8" diameter pipe respectively. These runs are identified on sheet SA-01. Copies of written assurances stating any additional sewer maintenance required by reduced slopes will be provided have been included with this request and originals have been sent to your office from the City.

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Chapter 12.5.3.b indicates that if a lift station can be eliminated as well as substantial cost savings realized, sewers may be designed at the previously stated slopes, which is applicable in this situation. These requested slopes should provide adequate service from the service connection to the pump station. Additional maintenance is readily available from T&L Cleaning as previously mentioned. Estimated cost savings is $12,500 for the pump station and backup power that would not be necessary. Additional savings would be realized in the pipe trenching depth.

Lagoon Treatment Facility:

1. Chapter 18C.5.1: Request to reduce the number of lagoon cells from 3 to 2. Chapter 18C.1.2 indicates variances may be granted in this situation where treatment provides "at least equivalent effectiveness while significantly reducing costs." The total surface area of the proposed lagoon is 2.97 AC, (2.16 AC in primary and 0.45 AC in each secondary) and the same surface area will be provided with a 2-cell lagoon design. This design will save construction costs, and improve the ability of Rural Development and the City to complete the project while providing a consistent level of treatment effectiveness. Estimated cost savings is $22,250 based on rip-rap and excavation quantity reductions.

   In regards to providing equivalent effectiveness, the 2-cell lagoon will provide the same treatment capacity including the same BOD loading and hydraulic capacity. The hydraulic capacity will provide 180 days of storage with 60 days of storage in the secondary cell as opposed to 2 secondary cells with 30 days of storage each. The BOD loading on the primary cell will be 16.6 lb BOD_5/AC/Day, and the BOD loading on the secondary cell will be the same as if it were two separate cells. In the event maintenance is needed on the primary cell, influent can be rerouted to the secondary cell.

   MEC has completed several 2-cell lagoons for Rathbun Rural Water, Poweshiek Rural Water, and Clay Regional Water Associations. It is our experience this variance will provide equivalent effectiveness in complying with effluent limitations.

   It is our understanding 2-cell lagoons falls under a pilot program for franchised utilities, however two cities in a similar situation to Palmer (not associated with a franchised utility) have recently been granted variances to construct a 2-cell lagoon as opposed to a 3-cell lagoon. These cities are Riverton and Silver City with populations of 333 and 252 respectively. These Cities are working with Rural Development on their wastewater projects.

2. Chapter 18C.5.6.2: Request to use buried valves and two-level draw-off for inter-cell control to replace control structures. Piping in this

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system will be ductile iron. A member of the City staff will be able to exercise the valves on a frequent basis to ensure they are in good condition. These valves will provide the ability to isolate either cell in the event it is necessary for an emergency or maintenance, and still provide adequate storage. The proposed buried valve system will provide 2 draw off levels which is equivalent to an inter-cell control structure. Estimated cost savings is $2,000.

3. Chapter 18C.7.4.1: Request to use PVC piping for influent piping. Estimated cost savings is $1,750.

Each of the above requested variances has been researched as a part of the unsewered community pilot program. It is our opinion that these variances have indicated equivalent effectiveness, and can save these communities valuable construction costs.

If you have any questions, please give me a call.

Very truly yours,

McCLURE ENGINEERING COMPANY

Joseph C. Ward, E.I.

Enclosure

cc: Darryl Anderson
Steve Hosel
Pat Bormann
Jim Gailey

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Julie Rosenboom, Clerk
P.O. Box 131

CITY OF PALMER

IN
POCAHONTAS COUNTY

PALMER, IOWA
50571

712-359-2430

November 9, 2004

Mr. Satya Chennupati
Iowa Dept. of Natural Resources
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319

RE: Wastewater Disposal Improvements
Palmer, Iowa

Dear Satya:

This letter is submitted to provide written assurance to the department that any additional sewer maintenance required by reduced slopes and velocities will be provided in accordance with Iowa DNR Code Chapter 12.5.3. The sewer slopes to be designed are 0.34% and 0.22% for 6" and 8" diameter pipe respectively, in accordance with Iowa DNR Code Chapter 12.5.3. Maintenance shall be provided Doug Helmers who is a City employee and in the event he is unable to service the sewer system it shall be provided by T&L Cleaning of Fort Dodge.

Please call if you have any questions.

Sincerely,

Darryl Anderson, Mayor

cc: Pat Bormann
Joe Ward
Steve Hosel

Denni Hadley Council Person
John McBurk Council Man
Vicki Showers Council Person
Council Person

3022 PM 2:24 11/16/04

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September 14, 2004

Mr. Darryl Anderson, Mayor
City of Palmer
P.O. Box 175
Palmer, IA 50571-0175

RE: Palmer, Iowa Sanitary Sewer Improvements
MEC 14113

Dear Darryl:

The ability to clean the proposed collection system is a consideration that requires formal documentation before distances between manholes can be designed. The maximum spacing allowed by Iowa DNR for 8" and 6" pipes is 500' only if adequate cleaning equipment is available, otherwise it is 400'. T&L Cleaning, who the City has used in the past for storm sewer cleaning, has the ability to clean sanitary sewer if manholes are spaced at 500'. There would be no substantial cost difference in cleaning sewer pipes based on the difference in manhole spacing. This letter does not obligate you to use T&L Cleaning, but simply indicates your willingness to use a pipe cleaning company with the ability clean pipes with manhole spaced at 500'. Please sign and return this letter acknowledging this willingness so that we may move forward with design.

If you have any questions please don't hesitate to call Mike or myself.

Very truly yours,

McCLURE ENGINEERING COMPANY

Joseph C. Ward, E.I.

By: Darryl Anderson

Title: Mayor - City of Palmer

Date: 9/15/04

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September 13, 2004

T & L Cleaning
Gregg Haden
837 N. 22nd Street
Fort Dodge, IA 50501

RE: Wastewater Disposal Improvements
Palmer, Iowa
MEC 14113

Dear Gregg:

The City of Palmer is currently in the design process of constructing a sanitary sewer and treatment system. The ability to clean the proposed collection system is a consideration that requires formal documentation before distances between manholes can be designed. The maximum spacing allowed by Iowa DNR for 8" and 6" pipes is 500' only if adequate cleaning equipment is available. As we discussed on the phone you do have the ability to clean the sewer if this manhole spacing is 500'. Please sign and return this letter acknowledging this ability and willingness to work for the City of Palmer in the future if necessary.

Very truly yours,

McCLURE ENGINEERING COMPANY

Joseph C. Ward, E.I.

cc: City of Palmer

FORT DODGE
705 First Avenue North
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By: Gregg A Haden

Title: PRESIDENT

Date: 9-15-04

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Julie Rosenboom, Clerk
P.O. Box 131

CITY OF PALMER
IN
POCAHONTAS COUNTY

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712-359-2430

November 9, 2004

Mr. Satya Chennupati
Iowa Dept. of Natural Resources
Henry A. Wallace Bldg.
900 East Grand
Des Moines, IA 50319

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Palmer, Iowa

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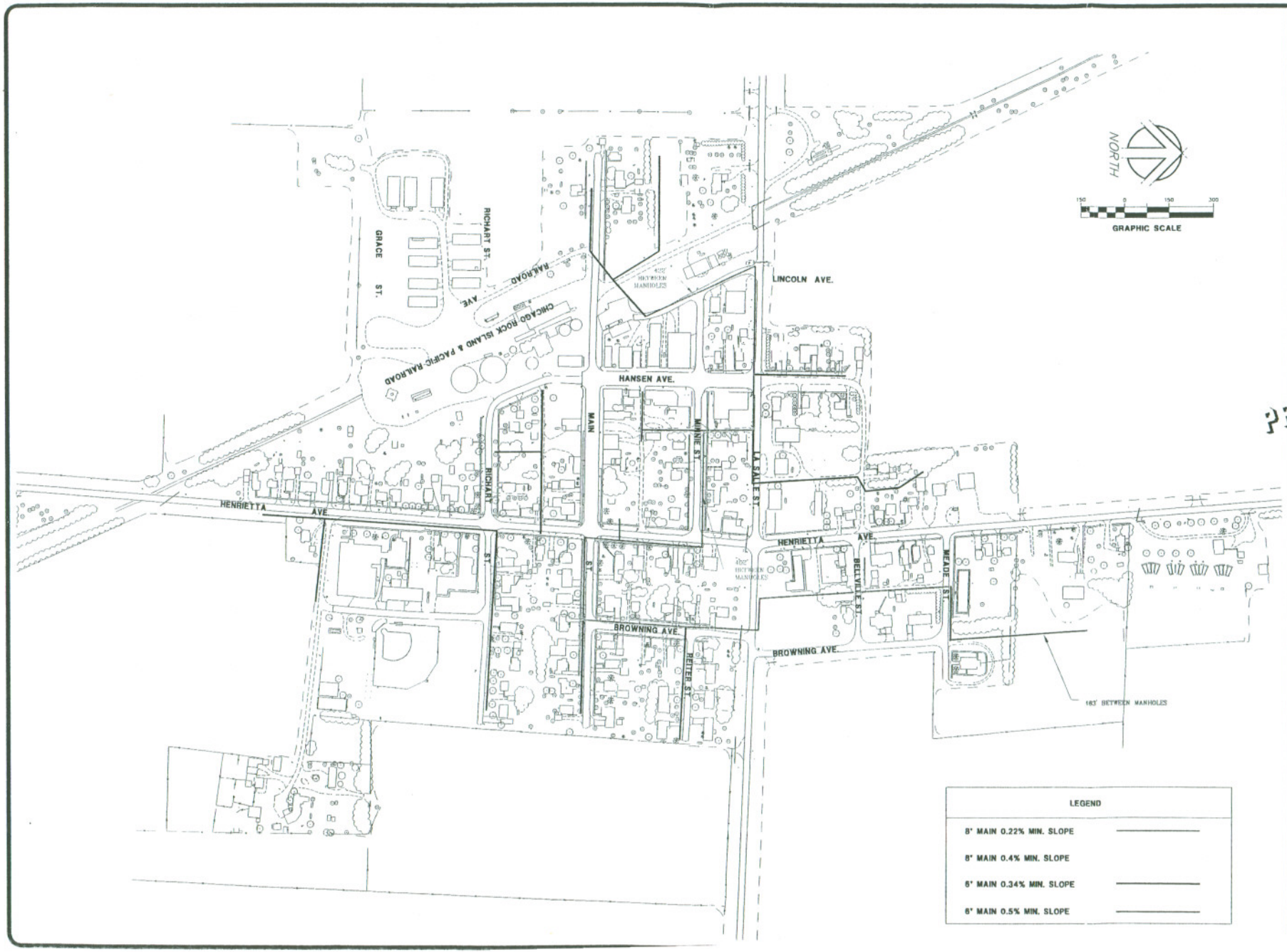
Please call if you have any questions.

Sincerely,

Darryl Anderson, Mayor

cc: Pat Bormann
Joe Ward
Steve Hosel



PRELIMINARY

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Coralville, Iowa 52241
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COLLECTION SYSTEM PLAN

SANITARY SEWER IMPROVEMENTS
PALMER, IOWA
14113

REVISIONS

ENGINEER	DRAWN BY
MFT	NPB
CHECKED BY	FIELD BOOK NO.
JCW	1035
DRAWING NO.	SHEET NO.