

DR 69-9 - Review under Section 204 of
Proposed Sewage Pumping Station for
Park City Improvement District.

ACTION

DATE

COMMITTEE _____

M.A.P.C. Approved 5-8-69

B.C.C./B. CO. C. _____

NOTIFICATION OF GRANT-IN-AID ACTION		Johnson		Do Not Use This Space				
1. STATE APPLICATION IDENTIFIER		2. (Reserved for use by State central information reception agency)						
None Indicated								
3. GRANTOR: a. Federal agency								
Environmental Protection Agency								
b. Organizational unit								
Management Division								
c. Administering office - (1) Name								
Grants Administration Branch - Region VII								
(2) Address - Street or P.O. Box		City	State	Zip Code				
1735 Baltimore - Room 249		Kansas City	Missouri	64108				
4. FEDERAL AGENCY GRANT IDENTIFIER: a. Code								
C200310								
b. Title								
Construction Grants for Wastewater Treatment Works								
c. Purpose								
New lift station.								
5. GRANTEE: a. Name								
Park City Improvement District								
b. Address - Street or P.O. Box		City	State	Zip Code				
6125 North Hydraulic		Wichita	Kansas	67219				
6. GRANTEE TYPE (Check only the single most applicable box)								
a. State	b. Inter-state	c. County	d. City	e. School district	f. Special unit	g. Community action	h. Sponsored organization	i. Other
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. APPLICATION RECEIPT DATE		8. ACTION DATE		9. EFFECTIVE STARTING DATE		10. ENDING DATE		
Year	Month	Day	Year	Month	Day	Year	Month	Day
69	9	26	72	9	18	N/A	N/A	
11. TYPE OF ACTION (Check as many boxes as apply to this action)								
a. New grant	b. Continuation grant	c. Supplemental grant (identify agency in item 16)		d. Change in existing grant				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	(1) Increase in duration	(2) Decrease in duration	(3) Cancellation	(4) Increase(\$)	(5) Decrease(\$)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
12. AMOUNT OF CONTRIBUTION			b. State	c. Local	d. Other			
a. Federal - (1) basic	(2) Supplemental		\$ Not Available	\$ N/A	\$ N/A			
\$ 57,030.00	\$ N/A							
13. CATALOG OF FEDERAL DOMESTIC ASSISTANCE PROGRAM (if none, clarify in item 16)			a. Program Number	b. Supplemental Program Number				
			66,400					
14. AUTHORIZATION								
a. Federal Budget Accounts			20-00-0103-0-1-401					
b. Public Laws			PL	Title	Sec.	PL	Title	Sec.
			84-660	40	8			
c. U.S. Code			33 U.S.C. 1158 et seq.					
15. FACILITY LOCATION: (For facility grant actions only)								
a. City				b. County				
Wichita				Sedgwick				
16. REMARKS								
Charleen E. Aggeler Grants Assistant 816-374-5593								

STANDARD FORM 240
June 1970 Bureau of
Budget Circular A-98
240-101

DR-69-9

May 9, 1969

Reiss & Goodness Engineers
2160 East Douglas
Wichita, Kansas 67214

Re: Park City Sewage Pumping Station
Case No. DR 69-9

Dear Mr. Goodness:

On Thursday, May 8, 1969, the Wichita-Sedgwick County Metropolitan Area Planning Commission did review the application for a Federal grant for funds to be used toward constructing a sewage pumping station for the Park City Improvement District. The comments and recommendations along with "Exhibit A" establishing the authority of the Planning Commission are attached in quadruplicate for your use in the application.

Your plans and specifications on the project are being returned to you under separate cover. It would be of interest to this department to know what action is taken by the Federal government toward approving this application for a grant. We are pleased to be of service to the Park City Improvement District and to you as their consultant engineer. If any additional assistance is needed please call us.

Yours very truly,

James P. Looney
Community Facilities Planner

JPL:bh

cc: Mr. L. T. Mc Daniel
President of Board of Directors, Park City Improvement District
Enclosures

REGISTERED PROFESSIONAL ENGINEERS:
CHARLES M. GOODNESS
AL E. REISS

PHONE (316) 264-1391

REISS & GOODNESS ENGINEERS

Consulting Engineers

2160 E. DOUGLAS AVE.
WICHITA, KANSAS 67214

April 28, 1969



DR 69-9

Mr. James P. Looney
Community Facilities Planner
Wichita-Sedgwick County Metropolitan
Area Planning Department
104 S. Main Street
Wichita, Kansas 67202

Re: Park City Improvement District
Sedgwick County, Kansas
Sewage Pumping Station

Dear Mr. Looney:

Park City Improvement District is proposing to construct a new sewage pumping station at the sewage purification plant. The existing pumping facilities are operating at maximum capacity and continuing growth in the area requires immediate increase in pumping facilities.

The proposed pumping station will be an integral part of the treatment plant and is one portion of the long-range planning which was made in 1961 under a HHFA planning grant.

The Improvement District is making application for financial assistance through the FWPCA. They require a statement from the local planning agency that the proposed improvement conforms with the comprehensive plan for the metropolitan area. Blank forms are enclosed for your use. Will you please complete and return them to us as soon as possible. If you have any questions, please feel free to call us.

A copy of our report to the Kansas State Department of Health is enclosed for your information. Under separate cover we are mailing to you a set of plans and specifications for the improvement. After using them, if you do not need them for your records, we would appreciate their return.

FWPCA
Fed. Water Pollution
Control Agency

FWPCA = Federal Water Pollution
Control Agency.

Very truly yours,

Charles M. Goodness
Charles M. Goodness, P. E.

CMG:h
Encls.

\$75,000 to \$80,000 Engineers
Estimate. If grant is approved they
can get 50 1/2 % of total.

REISS & GOODNESS ENGINEERS

2160 E. DOUGLAS AVE.
WICHITA, KANSAS 67214

April 28, 1969

Mr. Richard T. Page, P. E.
Water Pollution Control Section
Kansas State Department of Health
State Office Building
Topeka, Kansas 66612

Re: Sewage Pumping Station
Park City Improvement District
Sedgwick County, Kansas

Dear Mr. Page:

As engineers for the Park City Improvement District, Sedgwick County, Kansas, we have been instructed to prepare plans and specifications for a sewage pumping station for the District's sewage purification plant. This letter will be the Engineer's Report of the project.

In 1961 the Directors of the Improvement District became aware that with continued growth of the District, enlargements to the sewage plant would become necessary. A planning grant was obtained from the Housing and Home Finance Agency and a study was made with recommendations for future expansion of the plant to a population equivalent of 10,000 persons. The study report will not be repeated herein except by reference.

Since the date of the study report, there has been quite a bit of growth in the District. The new high school was completed and connected to the system, there are nearly 150 additional families in the area and a number of commercial establishments have been added to the system. A number of new homes will be constructed in the near future and a mobile home park will probably be added within the coming year.

As a result of growth in the District to the present time, the existing sewage pumping station at the sewage plant is continually overworked. This has resulted in severe maintenance problems and almost operating from "crisis to crisis". It has become imperative that action be taken to enlarge the pumping facility.

The design and construction of the present pumping station do not lend themselves readily to enlarging the existing station. The proposed plan is to construct a completely new, modern pumping station with attached laboratory and rest room facilities. The existing pumping station will be taken out of service.

April 28, 1969

The proposed pumping station will include a Parshall metering flume, a sewage comminutor, float controlled recirculation valve, four water sealed sewage pumps and fully automatic controls.

The laboratory building will include office space, laboratory cabinets with table top and sink, a refrigerator, pump control panel, entrance room with coat and boot racks, a rest room with toilet and lavatory and a shower unit. No laboratory equipment other than the cabinet with sink and the refrigerator will be furnished with this phase of the project.

The original study proposed the installation of three 400 g.p.m. pumps with two to operate under normal load and one to be on "standby". The proposed station will be equipped with four 400 g.p.m. pumps to operate in pairs and alternate. Under extreme conditions of sewage flow, the second pair of pumps will operate until sewage flow drops back to normal. The minimum design capacity of any existing sewage plant units (combined) is 850 g.p.m.

The pumps and comminutor will be controlled by a unit operated by the float in the Parshall flume. With minor changes in the electrical controls, future pumping can be adjusted to meet additional sewage loads. It should be unnecessary to change pump sizes for many years.

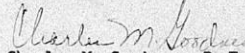
An electrode shall be installed in the wet well to shut off all pumps should a set of circumstances allow sewage in the wet well to drop below safe pumping levels for any reason.

We believe the sewage pumping station, as designed, will adequately serve the District for many years. The station as designed will be much easier and more pleasant to operate and maintain than the existing station. The design will allow the District to institute plant testing procedures and maintain records of plant operation, the absence of which has been pointed out a number of times in the past.

Financing of the project at the present time without financial assistance would work undue hardship on the District which is primarily residential. The District is making application herewith for financial assistance from the FWPCA. Signed application forms are included herewith together with an application for Sewer Extension Permit.

We respectfully request your review and approval of the plans and specifications as submitted. Following State Department of Health approval, additional plans and specifications will be forwarded to you for submission to the FWPCA.

Very truly yours,


Charles M. Goodness, P. E.

CMG:h
Encl.

WICHITA—SEDGWICK COUNTY



METROPOLITAN AREA PLANNING
DEPARTMENT

AMHERST 2-0611 — AREA CODE 316
CITY BUILDING ANNEX
104 S. MAIN ST.
WICHITA, KANSAS 67202

May 9, 1969

Reiss & Goodness Engineers
2160 East Douglas
Wichita, Kansas 67214

Re: Park City Sewage Pumping Station
Case No. DR 69-9

Dear Mr. Goodness:

On Thursday, May 8, 1969, the Wichita-Sedgwick County Metropolitan Area Planning Commission did review the application for a Federal grant for funds to be used toward constructing a sewage pumping station for the Park City Improvement District. The comments and recommendations along with "Exhibit A" establishing the authority of the Planning Commission are attached in quadruplicate for your use in the application.

Your plans and specifications on the project are being returned to you under separate cover. It would be of interest to this department to know what action is taken by the Federal government toward approving this application for a grant. We are pleased to be of service to the Park City Improvement District and to you as their consultanting engineer. If any additional assistance is needed please call us.

Yours very truly,

James P. Looney
Community Facilities Planner

JPL:bh

cc: Mr. L. T. Mc Daniel
President of Board of Directors, Park City Improvement District
Enclosures

**COMMENTS AND RECOMMENDATIONS
OF
STATE, METROPOLITAN OR REGIONAL PLANNING AGENCIES**

DATE: May 8, 1969
Planning Agency Case No. DR-69-9

Planning Agency:

~~Name~~ Wichita-Sedgwick County Metropolitan Area
Planning Commission
~~Address~~ 104 South Main, Wichita, Kansas 67202
Source of Authority for Establishment of Agency (See
Attachment - EXHIBIT "A")

Grant Applicant:

~~Name~~ Park City Improvement District, Sedgwick County, Kansas
~~Address~~ 6125 N. Hydraulic, Wichita, Kansas 67219

Project Description:

Sewage Pumping Station

Certification:

The project described above does does not () conform with the comprehensive plan developed or in process of development for the metropolitan area in which it is located.

Comments and Recommendations:

A motion was made, seconded and unanimously passed by the Wichita-Sedgwick County Metropolitan Area Planning Commission, certifying that the project is not in conflict with the Comprehensive Plan, in the process of development, and that it does not duplicate any like facilities.

C. Bickley Foster
(Signature)

Authorized Representative of Planning Agency
C. Bickley Foster, Secretary

Wichita-Sedgwick County Metropolitan Area Planning Commission

"EXHIBIT A"

AUTHORITY FOR ESTABLISHMENT OF THE WICHITA-SEDGWICK COUNTY
METROPOLITAN AREA PLANNING COMMISSION IS BY:

Joint agreement between the City of Wichita and Sedgwick County under the laws of the State of Kansas, K.S.A. 1965 Supp. 12-716 et. seq., and

Membership of cities in the Metropolitan Area Planning Commission is authorized by a joint resolution between the Board of County Commissioners of Sedgwick and Sumner Counties, and by ordinance enacted by the Cities of Wichita, Haysville, Derby, Valley Center, Mulvane, Cheney, Andale, and Goddard.

Applicable ordinances enacted by the cities are:

City of Wichita	No. 29-610
City of Haysville	No. 238
City of Derby	No. 741
City of Valley Center	No. 413
City of Mulvane	No. 375
City of Cheney	No. 386
City of Andale	No. 68-1
City of Goddard	No. 52

The Metropolitan Area Planning Commission was certified on June 20, 1967, by the Secretary of Housing and Urban Development as the areawide review agency for Sedgwick County under Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966.

WICHITA-SEDGWICK COUNTY
METROPOLITAN AREA PLANNING COMMISSION

AGENDA

MAY 8, 1969

The regular meeting of the Wichita-Sedgwick County Metropolitan Area Planning Commission will be held on Thursday, May 8, 1969, at 1:45 p.m. in Room 401 City Building Annex, 104 South Main, Wichita, Kansas, at which time the following items will be considered:

1. Invocation by Rev. Kenneth Short, First United Methodist Church.

2. Approval of Minutes of March 27, 1969.

3. Review and comments on Phases I and II of the proposed Model Cities Program. (To be distributed to the Planning Commission when available.)

4. DR 69-9 - Review Under Section 204 of proposed sewage pumping station for Park City Improvement District. (Memorandum is attached to the Planning Commissioners' copy of the agenda.)

5. DR 69-8 - Request from the City of Cheney for preparation of a Comprehensive Development Plan under the Community Planning Assistance Program of MAPC.

6. Consideration of closing old subdivision cases. Applicant and engineer have been notified that these cases would be placed on this agenda unless requested that they remain open.
 - A. S/D 62-32 - Kell-Rock Addition - Southwest corner of Kellogg and Rock Road. Application filed October 19, 1962.
 - B. S/D 59-52 - Replat of Lots 8, 9, 10, 11, Heuett Addition - Between Heuett and 33rd Street South. Application filed November 4, 1959.
 - C. S/D 63-1 - Replat of Lots 10, 11, 12, 13, Block B, W. M. Sidles Addition - Northwest corner of Pawnee and Spruce. Application filed January 2, 1963.

WICHITA-SEDGWICK COUNTY

METROPOLITAN AREA PLANNING DEPARTMENT

DATE

May 1, 1969

THE
ROAD TO
SAFETY



TO Members of the Metropolitan Area Planning Commission

FROM James P. Looney, Community Facilities Planner
Long-Range Planning Division

SUBJECT Review of Proposed Sewage Pumping Station
Park City Improvement District

Reiss and Goodness, Consultant Engineers, have submitted a request for a review of a proposed sewage pumping station for the Park City Improvement District. This review would be in accordance with Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966. As you know the review is to determine whether the proposed project conforms with elements of the Comprehensive Plan in the process of development for the Wichita-Sedgwick County Metropolitan Area. Design criteria and engineering detail, performed by the consulting engineer, are not a part of the review as they are not considered a responsibility of the Planning Agency.

The sewage pumping station is a necessary accessory to the Park City sewer system. However, the Utility Facilities Plan Report deals only with the adequacy of the Sewage Treatment Plant for Park City. Reference to pumping stations within the system would be considered engineering detail, not a part of the general planning function. However, it can be stated that the proposed facility is located properly at the existing Sewage Treatment Plant, it does not conflict with any similar facilities, and that it is not in conflict with the Comprehensive Plan which is in the process of development for the Wichita-Sedgwick County Metropolitan Area.

Recommendation

It is recommended that the Wichita-Sedgwick County Metropolitan Area Planning Commission instruct the Secretary to notify the applicant that the proposed sewage pumping station for Park City

Page 2 - Review of Proposed Sewage Pumping Station
Park City Improvement District
May 1, 1969

is not in conflict with the Comprehensive Plan which is in the process of development, and that it does not duplicate any like facilities.

APPROVED BY:

C. Bickley Foster
C. Bickley Foster
Director of Planning

JPL:rme

REGISTERED PROFESSIONAL ENGINEERS:
CHARLES M. GOODNESS
AL E. REISS

PHONE (316) 264-1391

REISS & GOODNESS ENGINEERS

Consulting Engineers

2160 E. DOUGLAS AVE.
WICHITA, KANSAS 67214

May 1, 1969

Mr. James P. Looney
Community Facilities Planner
Wichita-Sedgwick County Metropolitan
Area Planning Department
104 S. Main Street
Wichita, Kansas 67202

Re: Park City Improvement District
Sedgwick County, Kansas
Sewage Pumping Station

Dear Mr. Looney:

Pursuant to your request, we are enclosing herewith a copy of our preliminary engineering report on the sewage purification plant enlargement for the Park City Improvement District that was made November 22, 1960.

Very truly yours,

Charles M. Goodness
Charles M. Goodness, P. E.

CMG:h
Encl.



REISS & GODNESS ENGINEERS

4005 E. KELLOGG AVE.
WICHITA 17, KANSAS

Nov. 22, 1960

Mr. Stanley M. Smith, Chief
Water Pollution Control Section
Kansas State Board of Health
State Office Building
Topeka, Kansas

Re: Engineer's Preliminary Report
Sewage Purification Plant Enlargement
Park City Improvement District
Sedgwick County, Kansas

Dear Mr. Smith:

Following our discussions of last week in your office, we have prepared this preliminary report for the sewage purification plant enlargement at Park City. I certainly appreciated the time you and Dick Page gave me for our preliminary discussions. Some of your helpful suggestions have been incorporated in our preliminary planning. The following report covers the items for the enlargement with which you would be most concerned. Your comments on the items covered herein or on items not specifically covered will be appreciated.

A. Population Data:

Population equivalent of present plant - 4,500
Design for future population equivalent - 10,000

B. Flow Data:

Average per capita water use (including commercial use) from August, 1959 to July, 1960 inclusive was 55 g.p.c.d. Design flow to be taken at 100 g.p.c.d. (24 hr avg.)

24 hr. avg. flow; $\frac{100 (10,000)}{24}$ = 694 g.p.m.
16 hr. avg. 1.5 (694.4) = 1041.6 g.p.m.
4 hr. peak 1.75 (694.4) = 1215.2 g.p.m.
Hourly peak, incl. infiltration 2.0 (694.4) = 1389 g.p.m.

Allow for 1:1 recirculation at average 24 hour flow.
Design flow for plant = 1400 g.p.m.
= 2.02 m.g.d.



C. Design Data for Structures:

I. Sewage Pumping Station:

Flow for 10,000 population = 1389 g.p.m. peak.
Design flow for plant = 1400 g.p.m.

Plant flow to be recirculated from final tank sludge hoppers.
Control shall be by butterfly valve, float controlled, at lift station.

Lift station to be designed with four 700 g.p.m. pumps with time alternator.

II. Grit Removal:

Combined pre-aeration and grit removal does not appear practical.
Will use grit channels w/grit removal equipment equal to Link-Belt Straight Line Collector.

III. Pre-Aeration:

Pre-aeration to be considered only if it appears feasible to use only the existing trickling filters. If additional trickling filter is considered necessary, pre-aeration will not be used.

Required: Min. aeration period - 30 min.
Firm blower capacity - 0.25 cf/gal.
Width to depth ratio - 1:1 preferred
2:1 max.

Volume required:

$$\frac{1400 (30)}{7.48} = 5615 \text{ cu. ft.}$$

Provide tank: 13'x13'x33.25' = 5619 cu. ft.
Use spiral flow.

Blower capacity required:
1400 g.p.m. x 0.25 = 350 cu. ft./min.

IV, Primary Sedimentation:

Required: Overflow rate of 1000 gal./sq. ft./day at maximum hourly rate of flow. Use design flow of 1400 g.p.m.

Detention to be 2 to 3 hours at average dry weather flow.

Present tanks have combined surface of 816 sq. ft. area and volume of 5834.4 cu. ft.

November 22, 1960

$$\text{Total area required} = \frac{1400 (1440)}{1,000} = 2016 \text{ sq. ft.}$$

$$\text{Additional area required } 2016 - 816 = 1200 \text{ sq. ft.}$$

$$\text{Provide 3 tanks } 12' \times 34' \text{ (inside dimension)} = 1224 \text{ sq. ft.}$$

Construct and equip additional tanks the same as the two existing primary tanks.

$$\text{Average depth } 7.15 \text{ ft.}$$

$$\text{Volume provided} = 5 (7.15) (408) = 14,586 \text{ cu. ft.}$$

$$\text{Detention provided} = \frac{14,586 (7.48)}{694.4 (60)} = 2.6 \text{ hrs.}$$

Sludge will be drawn off from tanks at timed intervals with time controlled hydraulic operated valves.

V. Trickling Filters:

Existing filters - 3 @ 68' diam.; 7 ft. rock depth.

$$\text{Total existing surface area} = 0.249 \text{ acres.}$$

$$\text{Total existing rock volume} = 1.74 \text{ acre-ft.}$$

Existing distributors will handle 250 g.p.m., 300 g.p.m. and 300 g.p.m.; total 850 g.p.m.

Rock in existing filters meet specifications for standard rate filter.

Load to filters (with pre-aeration) assume 45% removal in primary. Add 25% for garbage grinders (most of homes are equipped with garbage grinders.)

$$10,000 (0.168) (1.25) (0.55) = 1155 \text{ lbs./day.}$$

$$\text{Volume of rock required} = \frac{1155}{650} = 1.78 \text{ acre-ft.}$$

$$\text{Actual loading on present filters would be } \frac{1155}{1.74} = 664 \text{ lbs./acre-ft.}$$

Distributors will be modified to each handle a flow of 467 g.p.m.

$$\text{Hydraulic loading} = \frac{2.02}{0.249} = 8.1 \text{ m.g.d./acre.}$$

This loading places filters in the "high-rate filter range". (Rock is for standard rate filter.)

Load to filters without pre-aeration.

Assume 30% reduction of B.O.D. in primary.

$$10,000 (0.168) (1.25) (0.7) = 1470 \text{ lbs.}$$

$$\frac{1470}{650} = 2.26 \text{ acre-ft.}$$

November 22, 1960

Additional rock required = 0.52 acre-ft.
Provide one additional filter equal to original three.
Total rock = 2.32 acre-ft.
Total surface = 0.332 acres.

Hydraulic loading = $\frac{2.02}{0.332}$ = 6.08 m.g.d./acre.

Each distributor will handle 350 g.p.m.
Present distributors will be modified.

Hydraulic loading places the filters in the "no-mans land" between low-rate and high-rate filters (See FSIMA Manual of Practice No. 8)

Actual B.O.D. load to 4 filters = $\frac{1470}{2.32}$ = 633 lbs./acre ft.

There are two possibilities to consider with respect to the trickling filters.

- (1) The plant can be equipped with pre-aeration and operate with the three existing filters. This would place the filters in the high-rate classification with respect to hydraulic loading and slightly over the recommended loading for standard filters with respect to B.O.D. It should also be noted in this connection that the filter rock in the present filters meets requirements for standard rate filters. A question was raised during preliminary discussions concerning the adequacy of the effluent drain channel under the filters if effluent from more than one filter was to be carried through it. Calculations indicate that the channels at the critical (smallest) section are more than adequate to handle flow from the filters even if an additional filter is placed in series on the channel.
- (2) If pre-aeration is not installed in the plant, an additional standard rate filter will be necessary. The B.O.D. loading will then be 633 lbs./acre-ft./day. The hydraulic loading will become 6.08 m.g.d. per acre of surface which falls in the "no-mans land" between low-rate and high-rate filters.

Considering the fact that the rock in the present filters meets standard-rate requirements, that the B.O.D. loading with one additional filter falls within the recommended rate, that pre-aeration adds a continual operational expense, and that there is a considerable divergence of opinion regarding the benefits of pre-aeration, we feel the additional filter without pre-aeration is the better approach to the enlargement. State Board of Health comments will be appreciated.

VI. Final Sedimentation:

Required: Min. detention of 1 hr. at max. rate of flow.

Overflow rate to be not more than 1000 gal. per day per sq. ft. at max. rate of flow.

November 22, 1960

Present tanks have a total surface area of 884 sq. ft. and total volume of 30,400 gal. above hoppers.

$$\frac{1400 (1440)}{1000} = 2016 \text{ sq. ft. surface required.}$$

Additional area required = 1132 sq. ft.

Provide 3 additional tanks 442 sq. ft. ea. = 1326 sq. ft.

Dimensions 13' x 34' x 5.0 ft. to hopper.

$$\text{Detention} = \frac{5 (442) (5.0) (7.48)}{1400 (60)} = 0.98 \text{ hr. w/no recirc.}$$

Tanks of the dimensions indicated would have one hour detention at design flow with no recirculation and without figuring the hopper volumes. With recirculation from the hoppers there will be no volume required for sludge accumulation and the detention will be of considerably greater duration.

VII. Sludge Digestion:

Existing digesters:

Primary - Heated, capacity 15,000 cu. ft.

Secondary - Not heated, capacity 12,800 cu. ft.

Total combined capacity = 27,800 cu. ft.

Required: For heated digesters with increase for garbage grinders use 5.0 cu. ft./cap.

Reduce volume by 15% for 1:1 slope on bottom.
 10,000 (5.0) (0.85) = 42,500 cu. ft.
 Add volume required - 14,700 cu. ft.

Provided: One additional primary digester equivalent to existing primary.

Provide additional heating equipment.

Provide gas collectors and use digester gas to heat sewage; natural gas stand-by.

Arrange piping to operate two primary digesters in parallel and in series with secondary digester.

VIII. Sludge Handling:

Existing sludge beds have area of 10,120 sq. ft.

For additional sludge disposal provide loading dock and tank loading facilities. Farmers in area will haul sludge to farm land.

IX. Oxidation Pond Loading:

Total pond area = 5.8 acres.

Assume max. pre-treat. efficiency of 80% (K.S.B.H. Policy)

November 22, 1960

Total 5 day B.O.D. load to ponds

$$10,000 (0.168) (1.25) (0.20) = 417.5 \text{ lbs.}$$

$$\text{Loading on ponds} = \frac{417.5}{5.8} = 72 \text{ lbs. 5 day B.O.D./acre/day.}$$

Addition to the oxidation ponds is not anticipated at this time. Additions, if required, would be possible but difficult and costly.

D. Stages of Enlargement Program:

It is planned to carry out the enlargement program for the sewage purification plant in stages. Finances for the construction work will become available from hook-on charges as additional homes are built and occupied in the district. The need for additional treatment facilities being the direct result of future connections requires that the enlargements be staged on an equivalent population basis rather than a time basis. It is impossible now to estimate accurately the date when enlargements will become necessary.

To set up a stage program for the additions the various units of the final plant (10,000 pop. equiv.) have been calculated for the equivalent population load which each will handle as follows:

	Population	G.P.M.
(a) Primary Settling:		
1. Present tanks (without recirc.)	4,500	850
2. One additional tank	6,120	850
3. Two additional tanks	8,160	1130
4. Three additional tanks	10,200	1416
(b) Trickling Filters:		
1. Present three filters, with respect to rock	10,000	1400
(c) Distributors:		
1. Present distributors (850 g.p.m.)	6,100	850
2. One dist. mod. to 350 g.p.m.; two existing @ 300 g.p.m.	6,800	950
3. Two dist. mod. to 350 g.p.m.; one existing @ 300 g.p.m.	7,200	1000
4. All dist. mod. to 350 g.p.m.	7,560	1050
5. One add. dist. @ 350 g.p.m.; total of four	10,080	1400
(d) Final Sedimentation:		
1. Present tanks	4,500	850
2. One additional tank	6,630	921
3. Two additional tanks	8,840	1228
4. Three additional tanks	11,050	1535
(e) Digestion:		
1. Present digesters (27,800 cu. ft.)	6,500	908
2. One additional digester (42,800 cu. ft.)	10,070	1400

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As indicated on the accompanying chart, the stages of construction break nicely at 4,500 population; 6,000 population and 7,500 population. Construction program for the three stages would be as follows:

1st Stage (at population 4,500)

1. Construct new lift station equipped with four 400 g.p.m. pumps wired to operate two and two with time alternator.
2. Construct one primary sedimentation basin equipped with sludge removal equipment.
3. Modify the existing 250 g.p.m. distributor to handle 350 g.p.m.
4. Construct one additional final settling tank.
5. Add gas collecting equipment for existing digesters.

2nd Stage (at population 6,000)

1. Change two 400 g.p.m. pumps to 700 g.p.m. and wire to operate one 700 g.p.m. and one 400 g.p.m. pump together with alternation with second pair.
2. Construct one additional primary sedimentation basin.
3. Modify two remaining distributors to handle 350 g.p.m. each.
4. Construct one additional final settling tank.
5. Construct one additional primary digester.
6. Add to the heat exchanger and sludge pumping building and provide for additional sludge heating. Convert existing heat exchanger to use digester produced gas with natural gas as standby fuel.
7. Construct sludge loading dock and equipment.

3rd Stage (population 7500)

1. Change two 400 g.p.m. pumps to 700 g.p.m. Wire to operate two pumps at a time with time alternator.
2. Construct one additional primary sedimentation basin.
3. Construct one additional trickling filter, equivalent to the existing filters. Equip with 350 g.p.m. distributor.
4. Construct one additional final settling tank.

Miscellaneous Structures:

Miscellaneous structures for flow division and control shall be constructed as part of the first stage of enlargement. Structures shall be constructed with the required capacity for the final plant and portions not required will be blanked off until required.

Additional items which will be designed in the final plant will

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include a water line to a fire hydrant at the plant, laboratory facilities, wash room and concrete stairway to elevated structures. Remote controls for pumps will be considered.

Hydraulic calculations for plant piping have not been worked out at this time; however, wherever practical, piping will be designed for the maximum flow (10,000 population) and piping changes made during the first stage of the plant enlargement.

Enclosed herewith are two layout sketches showing the proposed locations for the structures included in the plant enlargement. If any questions arise during your review of this preliminary report, please contact us as soon as possible as we wish to proceed with final plans in the very near future.

Very truly yours,

Charles M. Goodness,
Engineer.

CMG:h
Encls.