The following information Supplements certain sections of RUS Bulletin 1780-2, Preliminary Engineering Report (PER). All documents referenced are available at the Iowa Rural Development website: http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program/ia

SECTION 2.d . Tabulation of users by monthly usage categories will be documented by using IA Guide A-4, Water/Sewer Project Information. While the applicant will provide much of the information for this document, it is essential that the engineer consider the number of residential, non-residential, and bulk users, and expected water/sewer flows, when developing alternatives for the proposed facility. Therefore, this document should be prepared jointly between the applicant and engineer to ensure the information is consistent. IA Guide A-4 will be included in the PER.

SECTION 4.h. Attachment A may be used to document annual O&M and short lived asset reserve costs.

SECTION 5.a. Attachment B (an embedded Excel spreadsheet) may be used to calculate the life cycle cost analysis.

SECTION 6.e. Itemize the proposed engineering fees into the following: Basic Services, RPR fees (show the hourly rate and estimated hours), and list each additional service separately. Attachment C may be used to document the proposed fees. For more information on the engineer's responsibilities, refer to the EJCDC, Standard Form of Agreement, and applicable RD attachments.

SECTION 6.f.ii and iv. Attachment A may be used to document annual O&M and short lived asset reserve costs.

ADDITIONAL INFORMATION
For additional information and guidance in preparing the preliminary engineering report, design, and construction please refer to the Iowa RD web site for the following:

- RUS Bulletin 1780-2.
- RUS Instruction 1780 Subpart C- Planning, Designing, Bidding, Contracting, Construction and Inspections.
- Open and Free Competition.

If you have any questions during the preparation of the Preliminary Engineer Report, please call the Rural Development State Engineer at 515-284-4136.

Attachment A
Sample Annual O&M and Short-Lived Asset costs
PER Section 4.h. Cost Estimates.

Alternative evaluation of Annual O&M and Short-Lived Asset Costs.

Example of information requested in the Preliminary Engineering Report. Only the costs to operate and maintain the alternative considered are shown in this section. All technically feasible alternatives will require an itemized O&M cost estimate. This cost estimate will be used in the life cycle cost analysis.

The O&M costs must clearly describe the items or task, show the year the event occurs, and the expense (cost to repair/replace) the item in today's dollars.

The following example is for a gravity sewer collection system and one lift station. Costs that apply to the general operations of the entire facility should not be shown here; such as operating the treatment system, city billing, insurance, or office supplies. This example is used in the Sample Life Cycle Cost Calculation spreadsheet available on the Iowa RD website.

Description	Recurrence (yrs)	Expense (in todays $)
Pump station electricity/telephone	Annual	$1,200
Pump station inspection/cleaning	Annual	$100
Operator duties specific to this alternative	Annual	$200
Total annual cost		$1,500
Short lived asset costs in the first 20 years		
Minor pump station repairs	3yrs	$100
Replace lift station pumps	10 yrs	$8,000
Repair/replace lift station controls	15 yrs	$500
Repair manholes	8yrs	$400
Check & clean manholes	20yrs	$3,000
Clean/flush sewers lines (some portion of lines)	5yrs	$1,000

PER Section 6.f.ii and iv. Annual Operating Budget

The O&M and short lived asset costs for the enter facility as improved needs to be provide for the recommend alternative. On existing systems the last 3 years actual O&M costs need to be provided in the PER. The additional costs of the improvements will be added to the proposed future budget.

The following sample is for a gravity sewer collection, 1 lift station, and a controlled discharge lagoon. The costs and items shown are for demonstration purpose only and not for actual costs or items.

Description	Recurrence (yrs)	Expense (in todays $)
Pump station electricity/telephone	Annual	$1,200
Pump station inspection/cleaning	Annual	$100
Operator	Annual	$8,000
Billing/accounting	Annual	$800
Office supplies	Annual	$100
Insurance/permits	Annual	$500
Lagoon Water testing/sampling	Annual	$700
Mowing lagoon and lift station	Annual	$600
Weed control	Annual	$100
Total annual cost		$12,100
Short lived asset costs in the first 20 years		
Minor pump station repairs	3yrs	$100
Replace lift station pumps	10 yrs	$8,000
Repair/replace lift station controls	15 yrs	$500
Repair manholes	8yrs	$400
Check & clean manholes	20yrs	$3,000
Clean/flush sewers lines (some portion of lines)	5yrs	$1,000

Attachment B

Sample Life Cycle Cost Calculation #1

Project name: Sample city

Alternative: Gravity sewer one lift station

This is a sample of the information RD will be looking for. This spreadsheet is fillable and calculates the present worth.

Enter the dollar amounts in the yellow highlighted areas. Provide a detailed listing of items, year, and cost in todays dollars. The items, costs, and time frame shown is an example only. The Applicant and Project Engieer will need to determine each specific project needs.

Year of repair replacement	Item / event #2	2014 Federal discount rate conversion factor #1	Cost of event in todays dollars	Present value
1	annual O&M costs	17.687	$ 3,050	$ 53,946
1		0.988		$ -
2		0.976		$ -
3		0.965		$ -
4		0.953		$ -
5		0.942		$ -
6		0.931		$ -
7		0.920		$ -
8		0.909		$ -
9		0.898		$ -
10	pumps	0.888	$ 8,800	$ 7,810
11		0.877		$ -
12		0.867		$ -
13		0.856		$ -
14		0.846		$ -
15	manholes	0.836	$ 4,000	$ 3,345
16		0.826		$ -
17		0.816		$ -
18		0.807		$ -
19		0.797		$ -
20	pumps	0.788	$ 8,800	$ 6,932
20	salvage value #3	-0.788	$ 600,000	$ (472,651)
	(This may be a negative value)		**TOTAL Present Value**	**$ (400,618)**

Annual O&M costs

Pump station electricity/tele	$1,150
Pump station inspection/clean	$100
Collection system general labor	$500
Billing/accounting	$600
Office supplies	$100
Insurance/permits	$500
Minor pump station repairs	$100
Total	$3,050

Replace pumps $8,000

repair/replace controls	$500
repair manholes	$300
Total	$8,800

Check & Clean manholes $3,000

clean check sewer lines	$1,000
	$4,000

Replace pumps $8,000

repair/replace controls	$500
repair manholes	$300
Total	$8,800

Total Project cost **$ 1,000,000**

Present worth is = Project cost + Total Present Value **$ 599,382**

The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)

$$UPV = Cost \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

n=20
i=interest rate

The conversion factor for present value of a cost that occurs in a specific year (SPV)

$$SPV = Cost \times \frac{1}{(1+i)^n}$$

n=year
i=interest rate

#1. The Federal discount interest rate from OMB Cicular A94 for 2014 1.2%

#2. Explain each item in great detail on a separate sheet, do not lump items together
Supporting documenation may be requested on the life and cost of each item.

#3. Salvage value in the present worth calculaions.
Use straight line deperciation.
The salvage value is subtracted from the other present values to obtain the total present value.

Assumed life of the collection system is XX years
Construction cost is the cost to construct the system not including the engineering, legal, contingency, interest, and other non construction costs.

construction cost	useful life	years remaining	Value
$ 1,000,000	50	30	$ 600,000

Sample Life Cycle Cost Calculation #2

Project name: Sample city

Alternative: 3-cell lagoon

Year of repair replacement	Item / event #2	2014 Federal discount rate conversion factor #1	Cost of event in todays dollars	Present value
1	annual O&M costs	17.687	$ 6,100	$ 107,893
1		0.988		$ -
2		0.976		$ -
3		0.965		$ -
4		0.953		$ -
5		0.942		$ -
6		0.931		$ -
7		0.920		$ -
8		0.909		$ -
9		0.898		$ -
10		0.888		$ -
11		0.877		$ -
12		0.867		$ -
13		0.856		$ -
14		0.846		$ -
15		0.836		$ -
16		0.826		$ -
17		0.816		$ -
18		0.807		$ -
19		0.797		$ -
20		0.788		$ -
20	salvage value #3	-0.788	$ 400,000	$ (315,101)
	(This may be a negative value)		**TOTAL Present Value**	**$ (207,208)**

Annual O&M cost

Operator	$5,000
Water testing/sampling	$500
Mowing	$600
Total	$6,100

Total Project cost **$ 500,000**

Present worth is = Project cost + Total Present Value **$ 292,792**

The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)

$$UPV = Cost \times \frac{(1+i)^n - 1}{i(1+i)^n}$$

n=20
i=interest rate

The conversion factor for present value of a cost that occurs in a specific year (SPV)

$$SPV = Cost \times \frac{1}{(1+i)^n}$$

n=year
i=interest rate

#1. The Federal discount interest rate from OMB Cicular A94 for 2014 1.2%

#2. Explain each item in great detail on a separate sheet, do not lump items together

Attachment C
PER Proposed Engineering Fees for the Recommended Alternative

Alternative # _____

Lump Sum amount of Basic Services (A1.02 thru A1.06) **$**_____

Reimbursable expenses **$**_____

Resident Project Representative Services (RPR-2) **$**_____

The class of employee for this project is_____
The hourly rate is $_____
The number of RPR hours is estimated to be ___ hours

RPR Reimbursable Expenses **$**_____

Compensation for Additional Services (A2.01 and A2.02)
List all proposed services (services include reimbursable costs)

a. *(Task)* _____ *$* _____

b. *(Task)* _____ *$* _____

c. *(Task)* _____ *$* _____

d. *(Task)* _____ *$* _____

e. *(Task)* _____ *$* _____

f. *(Task)* _____ *$* _____

Total Additional Services **$**_____

TOTAL FEES $ _____