

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: <u>http://www.rd.usda.gov/programs-services/water-waste-disposal-Ioan-grant-program/ia</u>

**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 lowa 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	Expense (in todays
	(yrs)	\$)
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

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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     \$     -       20     0.797     \$     -       20     0.788     \$     -       20     0.788     \$     -       20     0.788     \$     -       20     0.788     \$     -       20     0.788     \$     -       20     0.788     \$     -       21     0.0797     \$     -       20     0.788     \$     -       21     0.0789     \$     -       20     0.788     \$     -       21     0.0789     \$     202,792       Total Project cost \$     \$       Total Project cost + \$     \$       n=20       if (1+i)^n     -       Interest rate       interest rate	5 6 7 8		0.965 0.953 0.942 0.931 0.920 0.909		\$ \$ \$ \$ \$ \$		Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
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$\begin{array}{c c c c c c c c c c c c c c c c c c c $	5 6 7 8 9 10 11 11 12 13		0.965 0.953 0.942 0.931 0.920 0.920 0.898 0.888 0.888 0.888 0.887 0.867 0.867		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
17     0.820     3     -       18     0.807     \$     -       19     0.797     \$     -       20     0.788     \$     -       20     0.788     \$     -       20 salvage value #3     -0.788     \$     -       21 salvage value #3     -0.788     \$     200       Cotal Project cost *     \$     500,000     \$       Present worth is = Project cost + Total Present Value     \$     292,792       The 0&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)     n=20       USDA Rural Development of the present value of a cost that occurs in a specific year (SPV)     Page 3 of 4			0.965 0.953 0.942 0.931 0.920 0.920 0.920 0.898 0.888 0.888 0.887 0.867 0.867 0.866 0.856		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
18       0.807       \$       -         19       0.797       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       0.788       \$       -         20       salvage value #3       -0.788       \$       -         20       salvage value #3       -0.788       \$       400,000       \$         (This may be a negative value)       TOTAL Present Value       \$       (207,208)         Total Project cost * \$       \$       500,000       \$       292,792         The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)       n=20       i=interest rate       Page 3 of 4         9       I       I       I       I       I       Page 3 of 4         9       Fourtiversion factor for present value of a cost that o			0.965 0.953 0.942 0.931 0.920 0.920 0.920 0.898 0.888 0.888 0.888 0.887 0.867 0.856 0.856 0.846 0.836		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
19       0.797       \$       -         20       0.788       \$       -         20 salvage value #3       -0.788       \$       -         20 salvage value #3       -0.788       \$       -         20 salvage value #3       -0.788       \$       400,000       \$         20 salvage value #3       -0.788       \$       400,000       \$       (315,101)         Total Project cost :       \$       500,000       \$       (207,208)         Total Project cost :       \$       500,000       \$       292,792         The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV)       n=20 i i=interest rate       Page 3 of 4         USDA Rural Development in [0wa       i (1+i)^n       n=20 i i=interest rate       Page 3 of 4         9 heconversion factor for present value of a cost that occurs in a specific year (SPV)       Page 3 of 4       Page 3 of 4			0.965 0.953 0.942 0.931 0.920 0.920 0.920 0.898 0.888 0.888 0.888 0.887 0.877 0.856 0.856 0.856 0.846 0.836 0.836		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
20       0.788       \$       -         20       salvage value #3       -0.788       \$       -         20       salvage value #3       -0.788       \$       400,000       \$       (315,101)         20       Total Project cost :       \$       500,000       (207,208)       -         Total Project cost :       \$       500,000       -       -       -         Present worth is = Project cost :       \$       500,000       -       -       -         Present worth is = Project cost :       \$       500,000       - <td></td> <td></td> <td>0.965 0.953 0.942 0.931 0.920 0.920 0.898 0.888 0.888 0.887 0.877 0.856 0.846 0.836 0.836 0.836 0.836</td> <td></td> <td>\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$</td> <td>- - - - - - - - - - - - - - - - - - -</td> <td>Water testing/sampling Mowing Total</td> <td>\$5,000 \$500 \$600 \$6,100</td>			0.965 0.953 0.942 0.931 0.920 0.920 0.898 0.888 0.888 0.887 0.877 0.856 0.846 0.836 0.836 0.836 0.836		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
20 salvage value #3       -0.788 \$ 400,000 \$ (315,101)         (This may be a negative value)       TOTAL Present Value \$ (207,208)         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)       n=20 i=interest rate         USDA Rural Development, n low       i (1+i)^n         i (1+i)^n       i (1+i)^n         Phetombersion factor for present value of a cost that occurs in a specific year (SPV)			0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.888 0.888 0.888 0.887 0.877 0.856 0.846 0.836 0.836 0.836 0.836 0.837		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
Total Project cost :         TOTAL Present Value (207,208)         Total Project cost :         TOTAL Present Value (207,208)         Total Project cost :         Sol,000         Present worth is = Project cost :         Total Present Value         Conversion factor is         for uniform present value (UPV)         USDA Rural Development, provent value (UPV)         I i (1+i) <sup>n</sup> i i (1+i) <sup>n</sup> Present value of a cost that occurs in a specific year (SPV)			0.965 0.953 0.954 0.931 0.920 0.909 0.898 0.877 0.856 0.856 0.856 0.846 0.836 0.836 0.836 0.836 0.836 0.836 0.836		\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$		Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
Image: Interpretent value (This may be a negative value )       TOTAL Present Value       \$ (207,208)         Total Project cost :       \$ 500,000         Present worth is = Project cost + Total Present Value       \$ 292,792         The O&M costs are the annual recurring cost for 20 years, the rate conversion factor is for uniform present value (UPV)       \$ 1000 million millio			0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.877 0.856 0.856 0.856 0.856 0.836 0.836 0.836 0.836 0.836 0.836 0.836 0.836	\$ 400,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
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) USDA Rural Development, proven in a specific year (SPV) i (1+i)^n Page 3 of 4 Page 3 of 4		Salvage value #3	0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.888 0.888 0.888 0.886 0.856 0.856 0.856 0.836 0.836 0.836 0.836 0.836 0.836 0.836 0.836 0.836	\$ 400,000	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
The O&M costs are the annual recurring cost for 20 years, the rate conversion factor is for uniform present value (UPV) USDA Rural Development, Plowa i (1+i) <sup>n</sup> Page 3 of 4 Page 3 of 4 Page 3 of 4		salvage value #3	0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.888 0.888 0.888 0.887 0.867 0.856 0.836 0.856	\$ 400,000 TOTAL Present Value	२     २ </td <td>- - - - - - - - - - - - - - - - - - -</td> <td>Water testing/sampling Mowing Total</td> <td>\$5,000 \$500 \$600 \$6,100</td>	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
The O&M costs are the annual recuring cost for 20 years, the rate conversion factor is for uniform present value (UPV) USDA Rural Development, Plowa i=interest rate Page 3 of 4 9 he conversion factor for present value of a cost that occurs in a specific year (SPV)		salvage value #3 (This may be a neg: Total Project cost + Tr	0.965 0.953 0.942 0.942 0.920 0.920 0.898 0.888 0.888 0.888 0.888 0.886 0.836 0.836 0.846 0.836 0.846 0.836 0.846 0.836 0.846 0.836 0.797 0.778 0.778	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
for uniform present value (UPV) USDA Rural Development i Quantity in Iowa i (1+i) <sup>n</sup> 9 he conversion factor for present value of a cost that occurs in a specific year (SPV) Page 3 of 4		salvage value #3 (This may be a neg: <b>Total Project cost</b> + Total	0.965 0.953 0.942 0.931 0.920 0.920 0.920 0.898 0.888 0.888 0.887 0.866 0.836 0.846 0.836 0.846 0.836 0.846 0.836 0.846 0.837 0.837 0.837 0.846 0.836 0.846 0.836 0.846 0.836 0.836 0.837 0.846 0.836 0.846 0.836 0.837 0.846 0.836 0.846 0.836 0.846 0.836 0.846 0.836 0.84600000000000000000000000000000000000	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
USDA Rural Development i lowa i=10 interest rate Page 3 of 4		salvage value #3 (This may be a neg: Total Project cost is = Project cost + To s are the annual reco	0.965 0.953 0.942 0.931 0.920 0.920 0.920 0.920 0.898 0.888 0.887 0.867 0.866 0.846 0.846 0.846 0.846 0.836 0.846 0.836 0.837 0.837 0.857 0.857 0.857 0.856 0.846 0.836 0.846 0.836 0.836 0.836 0.837 0.788 0.788 0.788 0.788 0.788 0.788 0.788 0.788 0.788 0.788	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
$\begin{array}{c} 1 \\ (1+1)^n \\ = 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\ 1 \\$		salvage value #3 (This may be a neg Total Project cost is = Project cost + To s are the annual rece esent value (UPV)	0.965 0.953 0.954 0.931 0.920 0.898 0.877 0.887 0.877 0.867 0.856 0.846 0.836 0.846 0.836 0.846 0.836 0.846 0.836 0.846 0.837 0.797 0.797 0.797 0.788 0.797 0.788 0.797 0.788 0.797	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
The Why ersion factor for present value of a cost that occurs in a specific year (SPV)		Salvage value #3 (This may be a negative Total Project cost is = Project cost + Total s are the annual recu esent value (UPV)	0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.877 0.867 0.856 0.846 0.856 0.846 0.836 0.846 0.836 0.846 0.836 0.877 0.797 0.797 0.788 -0.7888 -0.7888 -0.7888 -0.7888 -0.7888 -0.788	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	
		Salvage value #3 (This may be a negative Total Project cost is = Project cost + To s are the annual rect esent value (UPV) Cost (Cost) (Cost)	0.965 0.953 0.942 0.931 0.920 0.909 0.898 0.877 0.867 0.856 0.856 0.856 0.836 0.836 0.836 0.836 0.836 0.846 0.836 0.836 0.836 0.836 0.836 0.836 0.840 0.877 0.788 -0.7888 -0.7888 -0.7888 -0.7888 -0.7888 -0.7888 -0.7888 -0.7888	\$ 400,000 TOTAL Present Value	\$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$	- - - - - - - - - - - - - - - - - - -	Water testing/sampling Mowing Total	\$5,000 \$500 \$600 \$6,100	

	ii-yeai	
SPV= Cost x1	i=interest rate	
( 1+i ) <sup>n</sup>		
<b>#1.</b> The Federal discount interest rate from OMB Cicular A94 for 2014	1.2%	
<b>#2.</b> 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	\$ <u></u>	
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)

f. (Task)	\$
e. (Task)	\$
d. <i>(Task)</i>	\$
c. (Task)	\$
b. <i>(Task)</i>	\$
a. <i>(Task)</i>	\$

TOTAL FEES \$ \_\_\_\_\_