

## Module 7 Optional Exercise

### Water Supply Budget Calculations

#### A. General Elements of a Budget:

#### Values for Pheasant Run example:

- Customers	45
- Gallons billed previous year	2,700,000
- Basic Water Rate	\$12.50/month
- Water Consumption Rate	\$3.00/1,000 gal
- Delinquency Rate	5%
- Projected # New Customers	5
- # Months new cust. Present	3
- New Tap Fee	\$700
- Bulk Sales	\$25,000
- Salaries/Benefits	\$9,000
- Operation & Maintenance	\$3,500
- Chemicals/Testing	\$1,500
- Professional Services	\$3,500
- Debt service	\$15,000
- Debt service reserve	\$1,000
- Administration/Office	\$1,500
- System insurance	\$1,000
- Electricity	\$2,000
- Vehicle	\$500
- Miscellaneous	\$1,000
- Inflation Factor	1%
- Salary/benefit increase	3%
- Office purchases	\$500
- Utility rate increases	2.5%
- Insurance premium increases	\$250

#### B. Steps for Calculating an Annual Water Supply Budget:

- Step 1 - Determine the maximum projected revenue
- Step 2 - Adjust the projected revenue for delinquent payments
- Step 3 - Factor in new customers
- Step 4 - Adjust the delinquency rate and tap rates for new customers
- Step 5 - Add in other revenue sources
- Step 6 - Determine projected expenses
- Step 7 - Adjust projected expenses for inflation and expense increases
- Step 8 - Subtract revenue from expenses to get a budget total

**C. Example Calculations using the Pheasant Run figures:**

**Step 1 – Determine Maximum Projected Revenue:**

The Pheasant Run Development Water System has 45 customers. Each customer is billed a basic rate of \$12.50 a month for their drinking water. The consumption rate is \$3.00 per 1,000 gallons. During 2003 (Jan-Dec), the community used 2,700,000 gallons of water. What revenue can Pheasant Run expect during 2004?

$$[(\text{Total customers}) (12 \text{ months})(\text{basic water rate})] + [(\text{water consumption rate}) (\text{total gallons used previous year})]$$

First, let's plug the numbers into the calculation:

$$[(45 \text{ customers}) (12 \text{ months})(\frac{\$12.50}{\text{month}})] + [(\frac{\$3.00}{1,000 \text{ gallons}}) (2,700,000 \text{ gallons})]$$

Next, let's cancel out the units:

$$[(45 \text{ customers}) (12 \cancel{\text{ months}}) (\frac{\$12.50}{\cancel{\text{ month}}})] + [(\frac{\$3.00}{1,000 \cancel{\text{ gallons}}}) (2,700,000 \cancel{\text{ gallons}})]$$

$$(6,750) + [(0.003) (2,700,000)] \qquad (6,750) + (8,100)$$

Maximum Pheasant Run projected revenue for 2004= \$14,850.00

**Step 2 – Adjust the Projected Revenue for Delinquent Payments:**

During 2003, the manager of the Pheasant Run Water Supply found that 5% of the residents were delinquent with their water system payments. If their projected revenue for 2004 is \$14,850.00, what will their adjusted projected revenue be once they factor in delinquencies?

$$(\text{unadjusted projected revenue}) \times [(100\% \text{ revenue received}) - (\% \text{ revenue not received})]$$

$$(\$14,850) \times [(1.0) - (0.05)] \qquad (\$14,850) \times (0.95)$$

Pheasant Run adjusted projected revenue for 2004 = \$14,108

**Step 3 - Factor in new customers:**

Recently the Pheasant Run water system found out they will have 5 new customers that will be moving in the last 3 months of the year.

First, calculate the average consumed per customer:

(total gallons billed ÷ 12 months) ÷ total customers = avg. customer monthly consumption

(2,700,000 ÷ 12 months) ÷ 45 = 5,000 gallons/month avg. consumed per customer

Then, calculate the user fees the new customers will contribute:

[(# new cust) (mths of use)(base water rate)] + [(# new cust)(avg. cust. cnsmpt) (water cnsmpt rate)(mths of use)]

[(5 cust.) (3 ~~mths~~) (~~\$12.50~~)] + [(5 cust) (~~5,000 gal.~~) (~~\$3.00~~ / ~~1,000 gal~~) (3 ~~mths.~~)]

\$188 + \$225 = \$413

#### Step 4 – Adjust the delinquency rate and tap fees for new customers

Recall from previous information that Pheasant Run’s delinquency rate is 5%.

> New customer fees w/ delinquency rate =

(unadjusted projected revenue from new customers) x [(100% revenue received) – (% revenue not received)]

(\$413) x [(1.0) – (0.5)] = (\$413) x (0.95) = \$392

New customers (with a 15% delinquency rate) will contribute \$392

Pheasant Run’s new tap fees are \$700 per customer.

> Tap fees for new customers =

(tap fees per customer) x (number of new customers) = (\$700)(5) = \$3,500

#### Step 5 - Add in other revenue sources – such as bulk sales

The Pheasant Run water treatment plant provides bulk treated (disinfected and softened) water to the neighboring township. The neighboring township only provides disinfection on the bulk water.

Previously determined Pheasant Run information:

2004 projected revenue:	\$14,108
Adjusted new customer fees:	\$ 392
New customer tap fees:	\$ 3,500

<u>Let's add in projected bulk sales</u>	<u>\$25,000</u>
Total 2004 adjusted projected revenue =	\$43,000

## Step 6 – Determine projected expenses

Pheasant Run is using the expenses from 2003 to project for 2004:

### 2003 Expenses:

- *Salaries/Benefits	\$ 9,000
- Operation & Maintenance	\$ 3,500
- Chemicals/Testing	\$ 1,500
- Professional Services	\$ 3,500
- *Debt service	\$15,000
- *Debt service reserve	\$ 1,000
- *Administration/Office	\$ 1,500
- *System insurance	\$ 1,000
- *Electricity	\$ 2,000
- Vehicle	\$ 500
- Miscellaneous	\$ 1,000
<b>Total expenses from 2003:</b>	<b>\$ 39,000</b>

## Step 7 – Adjust projected expenses from 2003 for inflation and expense increases – then use this expense amount for 2004:

Pheasant Run expects the following inflation and expense increases:

- Inflation Factor	2%
- Salary/benefit increase	3%
- Office purchases	\$500
- Utility rate increases	2.5%
- Insurance premium increases	\$250

(\*The Inflation factor does not apply to salaries, debt service, debt service reserve, system insurance, administration/office, or the utility [e.g. electricity rate] because the above amounts already include inflation rates.)

Overall 2% inflation factor = (projected expenses that do not have applied inflation) x (2%)

Example: Operation & Maintenance – (\$3,500) x (0.02)  
= \$70

Total O&M cost for 2004 (\$3500 from 2003 + \$70 inflation rise) = \$3,570

3% Salary/benefit increase = (salary/benefits) x (3%)  
= (9,000) x (0.03)  
= \$270

2.5% Utility rate increase (electricity) = (electricity) x (2.5%)  
= (\$2,000) x (0.025)

= \$50

Using the above calculations where applicable, let's adjust our expenses from 2003 to 2004:

<b>Expenses</b>	<b>2003:</b>	<b>2004:</b>
- *Salaries/Benefits	\$ 9,000	\$ 9,270
- Operation & Maintenance	\$ 3,500	\$ 3,570
- Chemicals/Testing	\$ 1,500	\$ 1,530
- Professional Services	\$ 3,500	\$ 3,570
- *Debt service	\$15,000	\$15,000
- *Debt service reserve	\$ 1,000	\$ 1,000
- *Administration/Office	\$ 1,500	\$ 2,000
- *System insurance	\$ 1,000	\$ 1,250
- *Electricity	\$ 2,000	\$ 2,050
- Vehicle	\$ 500	\$ 510
- Miscellaneous	\$ 1,000	\$ 1,020
<b>Total expenses :</b>	<b>\$ 39,500</b>	<b>\$40,770</b>

**Step 8 - Subtract revenue from expenses to get a budget total**

Pheasant Run's 2004 projected adjusted budget:

Total adjusted revenue:	\$43,000
Total adjusted expenses:	-\$40,770
<b>Budget total</b>	<b>\$ 2,230</b>

**Step 9 – Further investigation**

Pheasant Run's 2004 projected income is \$2,230. This is less than the nonrecurring tap-fees of \$3,500 from the new customers. Consequently, the rate structure is insufficient and adjustments should be made to ensure that the system will generate sufficient revenue in the future.