Rural Water District No. 4
Douglas County, Kansas
Valuation of Territory
153 Acres Annexed by City of Eudora

Following the first settlement conference between RWD4 and the City of Eudora on October 24, 2007, the following calculations were provided by RWD4 to the City. These calculations demonstrate the value arrived at by RWD4 of $6.5 million if the water district is forced to release 153 acres of its service territory to the City. The $6.5 million is an estimate, on a present-value basis (NPV), of what RWD4 would lose in future revenues from sales of water service and waterline infrastructure contributions from the subdivision developers. The calculation method is provided below along with explanations of the items used as spreadsheet inputs.

Summary of Components of Value Lost:

NPV of Lost Revenue from lost sales of water services in the 153 acre annexed area (calculated below)	$5,352,481
NPV of Lost Infrastructure and Cost Contributions paid for by Developers	$1,176,900
Total NPV that would be lost if RWD4 releases service territory to Eudora	**$6,529,381**

Calculations Provided Below

For Settlement Discussions Only

Input Data Assumed			Cost	% Rev	Revenue
Units Per Acre	2.5	5/8" Meter	4,000	0.83	3,333
Total Acres	153	Water per 1000 gallons	6.50	0.66	4.29
Years to Develop	10	Water Minimum	24.50	0.66	16.17
Acres per year	15				
Gallons per month per meter	6,000	Interest Rate	2.27%		
Max Day Factor (x ave day)	2.00				
Peak Hour Factor (x max day)	2.00				

Year	Meters Per Year	Total Meters Added	Ave gpmon Total	Maximum Day gallons	Peak Hour gpm	Meter Revenue Year	Water Revenue Per Yr	Total Revenue Per Yr.	n years	Present Value Factor	2007 PV Developer	2007 PV Resident	2007 PV Total	Total PV Developer	Total PV Resident	Total Present Value
2008	38	38	229,500	15,300	21	127,495	19,237	146,732	1	0.9778	124,665	18,810	143,475	124,665	18,810	143,475
2009	38	77	459,000	30,600	43	127,495	38,473	165,968	2	0.9561	121,898	36,784	158,682	246,563	55,594	302,157
2010	38	115	688,500	45,900	64	127,495	57,710	185,205	3	0.9349	119,192	53,952	173,144	365,755	109,546	475,301
2011	38	153	918,000	61,200	85	127,495	76,947	204,442	4	0.9141	116,547	70,339	186,886	482,302	179,885	662,187
2012	38	191	1,147,500	76,500	106	127,495	96,183	223,678	5	0.8938	113,960	85,972	199,932	596,262	265,858	862,119
2013	38	230	1,377,000	91,800	128	127,495	115,420	242,915	6	0.8740	111,430	100,877	212,307	707,692	366,735	1,074,426
2014	38	268	1,606,500	107,100	149	127,495	134,657	262,152	7	0.8546	108,957	115,078	224,035	816,649	481,812	1,298,461
2015	38	306	1,836,000	122,400	170	127,495	153,894	281,388	8	0.8356	106,539	128,598	235,137	923,187	610,410	1,533,598
2016	38	344	2,065,500	137,700	191	127,495	173,130	300,625	9	0.8171	104,174	141,462	245,635	1,027,361	751,872	1,779,233
2017	38	383	2,295,000	153,000	213	127,495	192,367	319,862	10	0.7989	101,862	153,691	255,552	1,129,223	905,563	2,034,785
2018	0	383	2,295,000	153,000	213	0	192,367	192,367	11	0.7812	0	150,279	150,279	1,129,223	1,055,842	2,185,065
2019	0	383	2,295,000	153,000	213	0	192,367	192,367	12	0.7639	0	146,944	146,944	1,129,223	1,202,786	2,332,009
2020	0	383	2,295,000	153,000	213	0	192,367	192,367	13	0.7469	0	143,682	143,682	1,129,223	1,346,468	2,475,691
2021	0	383	2,295,000	153,000	213	0	192,367	192,367	14	0.7303	0	140,493	140,493	1,129,223	1,486,961	2,616,184
2022	0	383	2,295,000	153,000	213	0	192,367	192,367	15	0.7141	0	137,375	137,375	1,129,223	1,624,336	2,753,558
2023	0	383	2,295,000	153,000	213	0	192,367	192,367	16	0.6983	0	134,325	134,325	1,129,223	1,758,661	2,887,884
2024	0	383	2,295,000	153,000	213	0	192,367	192,367	17	0.6828	0	131,344	131,344	1,129,223	1,890,005	3,019,228
2025	0	383	2,295,000	153,000	213	0	192,367	192,367	18	0.6676	0	128,429	128,429	1,129,223	2,018,434	3,147,656
2026	0	383	2,295,000	153,000	213	0	192,367	192,367	19	0.6528	0	125,578	125,578	1,129,223	2,144,012	3,273,234
2027	0	383	2,295,000	153,000	213	0	192,367	192,367	20	0.6383	0	122,791	122,791	1,129,223	2,266,802	3,396,025
2028	0	383	2,295,000	153,000	213	0	192,367	192,367	21	0.6241	0	120,065	120,065	1,129,223	2,386,867	3,516,090
2029	0	383	2,295,000	153,000	213	0	192,367	192,367	22	0.6103	0	117,400	117,400	1,129,223	2,504,268	3,633,490
2030	0	383	2,295,000	153,000	213	0	192,367	192,367	23	0.5967	0	114,794	114,794	1,129,223	2,619,062	3,748,285
2031	0	383	2,295,000	153,000	213	0	192,367	192,367	24	0.5835	0	112,246	112,246	1,129,223	2,731,308	3,860,531
2032	0	383	2,295,000	153,000	213	0	192,367	192,367	25	0.5705	0	109,755	109,755	1,129,223	2,841,063	3,970,286
2033	0	383	2,295,000	153,000	213	0	192,367	192,367	26	0.5579	0	107,319	107,319	1,129,223	2,948,382	4,077,605
2034	0	383	2,295,000	153,000	213	0	192,367	192,367	27	0.5455	0	104,937	104,937	1,129,223	3,053,319	4,182,541
2035	0	383	2,295,000	153,000	213	0	192,367	192,367	28	0.5334	0	102,608	102,608	1,129,223	3,155,926	4,285,149
2036	0	383	2,295,000	153,000	213	0	192,367	192,367	29	0.5216	0	100,330	100,330	1,129,223	3,256,256	4,385,479
2037	0	383	2,295,000	153,000	213	0	192,367	192,367	30	0.5100	0	98,103	98,103	1,129,223	3,354,359	4,483,582
2038	0	383	2,295,000	153,000	213	0	192,367	192,367	31	0.4987	0	95,926	95,926	1,129,223	3,450,285	4,579,508
2039	0	383	2,295,000	153,000	213	0	192,367	192,367	32	0.4876	0	93,796	93,796	1,129,223	3,544,081	4,673,304
2040	0	383	2,295,000	153,000	213	0	192,367	192,367	33	0.4768	0	91,714	91,714	1,129,223	3,635,796	4,765,018
2041	0	383	2,295,000	153,000	213	0	192,367	192,367	34	0.4662	0	89,679	89,679	1,129,223	3,725,474	4,854,697
2042	0	383	2,295,000	153,000	213	0	192,367	192,367	35	0.4558	0	87,688	87,688	1,129,223	3,813,163	4,942,385
2043	0	383	2,295,000	153,000	213	0	192,367	192,367	36	0.4457	0	85,742	85,742	1,129,223	3,898,905	5,028,127
2044	0	383	2,295,000	153,000	213	0	192,367	192,367	37	0.4358	0	83,839	83,839	1,129,223	3,982,743	5,111,966
2045	0	383	2,295,000	153,000	213	0	192,367	192,367	38	0.4262	0	81,978	81,978	1,129,223	4,064,721	5,193,944
2046	0	383	2,295,000	153,000	213	0	192,367	192,367	39	0.4167	0	80,158	80,158	1,129,223	4,144,879	5,274,102
2047	0	383	2,295,000	153,000	213	0	192,367	192,367	40	0.4074	0	78,379	78,379	1,129,223	4,223,259	5,352,481

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Total Present Value 5,352,481

Rural Water District No. 4, Douglas County
Explanation of Calculations
For Settlement Discussion Only

The spreadsheet components for lost revenue are as follows:

1. **Units per acre.** The District, upon advice of its Professional Engineer has assumed that in residential subdivisions, a rule of thumb that can be used to approximate the density of urban development is 2.5 housing units per acre. For simplicity, we assumed that each meter installed would be a 5/8-inch water meter, whether the meters are used for single-family residential units, multi-family residential units, commercial developments or industrial developments.

2. **Total Acres.** This is simply the total number of acres annexed by the City. In this case, 153 acres is used for the annexations described in Ordinance Nos. 865, 861, 863, 791 and 857.

3. **Years to Develop.** The term "Years to Develop" indicates the time period assumed for build-out of the annexed areas, assumed to be 10 years in this case.

4. **Acres per Year**. "Acres per year" is a calculated amount computed by dividing the total number of acres to be developed by the years expected for development build-out.

5. **Gallons per Month per Meter.** This item represents the average gallons used by each water meter in the District on average.

6. **Max Day Factor and Peak Hour Factor.** These items help determine the water usage expected by the District during high use times, and may be of value in assisting the engineers in determining service capacities required in the territory.

7. **Cost and Revenue of a 5/8" Meter.** The "cost" indicates the price to be paid to the District by a landowner for the purchase of one benefit unit (with each benefit unit allowing for installation of one 5/8-inch water meter). The "revenue" is the net profit to the District after costs of installing the water meter and infrastructure are deducted. A $2,000 credit is issued to the developer from the $6,000 original price as a credit for infrastructure installed, resulting in a net cost of $4,000. The net revenue of $3,333 results after absorbing the average installation costs of $667 per meter.

   The 153 acres can be served without incurring any other infrastructure costs that are over-and-above what the District has planned, including for the provision of fire flow as a byproduct of having a 12-inch transmission line from the Johnson County pump station to the elevated water storage tank of the District.

8. **Cost and Revenue of Water per 1,000 gallons and Cost and Revenue for Water Minimum**

   The District bills its customers $24.50 for a minimum fee each month regardless of whether any water is used by the customer. In addition, a charge of $6.50 per 1,000 gallons is charged for water used. Therefore, an average water bill in the District for 6,000 gallons of water results in a monthly bill to the District customer of $63.50 ($24.50 + [6,000/1,000*6.50]). (continued)

The District purchases and resells treated water to its customers. The District's cost for water purchased and resold is approximately 34% of its revenues, or approximately $21.59 per average customer per month (34% x $63.50). The resulting net revenue stream is approximately 66% of revenue, or $41.91 per month for the average customer. This net revenue stream allows the District to absorb its operating costs such as salaries, office supplies and the like.

9. Interest Rate

The interest rate used for discounting the cash flows, for purposes of calculating the present value of lost revenues to the District, represents the weighted average cost of capital for the District. Interest rates on United States Treasury Securities with a 20-year maturation period closely approximate the interest rates the District is able to obtain from lenders such as the Kansas Department of Health and Environment, and those loans also have a 20-year repayment period. In addition, as the future cash flows presented in the attached spreadsheets are not adjusted for inflation, the discount rate must be an inflation-adjusted rate. The 20-year, Inflation Indexed Treasury Bond annual yield of 2.27% was the rate published by the United States Treasury on October 2, 2007.

Spreadsheet Columns

1. **Years.** Each customer lost by the District represents a net revenue stream for the duration that the meter is connected to the system, which is typically for an indefinite period of time. For purposes of calculating the value of the settlement, a period of 40 years was used.
2. **Total Meters Added and Average Gallons per Month.** These columns are used to calculate the annual revenues from meter sales and water sales. Total meter sales is calculated by multiplying the "units per acre" by the total acres, and dividing by the build-out period. (2.5 * 153/10=38.25). Average gallons per month is calculated by multiplying the "gallons per month per meter" times the number of customers in place that year. (6,000*38.25=229,500 in 2008).
3. **Max Day and Peak Hour gallons.** These items help determine the water usage expected by the District during high use times, and may be of value in assisting the engineers in determining service capacities of the water system.
4. **Meter Revenue per year.** This is the product of the Revenue per 5/8-inch meter multiplied by the number of meters installed that year. (38.25*3,333.33=127,495)
5. **Water Revenue per year.** This is the sum of the product of the revenue per 1,000 gallons multiplied by the average gallons per month in thousands, added to the revenue from monthly minimum fees on the total number of meters installed. ($16.17 + [6,000/1,000*4.29])*12*38.25= $19,237 in 2008.
6. **Total Revenue.** This is the sum of the Meter Revenue and the Water Revenue.
7. **n Years and PV factor.** These columns are used to derive the net present value of future cash flows to value the settlement.
8. **2007 PV Developer.** This is the calculated amount in today's dollars of the amount due if the meter fees are paid to the District in the estimated year of installation. The term "developer" is used because this development cost is often borne by the developer and recaptured by the developer in the sales price of lots, homes or buildings to residential, commercial or industrial occupants of the land and/or buildings.
9. **2007 PV Resident.** Were the District to provide the water to the annexed areas, the building occupants would pay a monthly water bill to the District. The term "resident" is used to suggest that this fee, representing the District's lost revenues on water sales for a 40-year period, would be paid to the District by the water customers.
10. **Total Columns.** The remaining columns reflect totals of various items useful in assessing the value of the settlement.