

**ANNEX to 3.6**  
**Cost Estimation for**  
**Proposed Wastewater**  
**Reuse Facilities**

## Annex to 3.6 Cost Estimation for Proposed Wastewater Reuse Facilities

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## Cost estimation for wastewater reuse facilities

(Price basis 2000)

### 1 Abu Nuseir

#### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0		0
Electromechanical equipment	1	0		0
Transmission main DN 300, concr.	m	600	70	42.000
Reservoir 8,000 m <sup>3</sup>	1	1	65.600	65.600
Distribution network	ha	80	not considered	0
Others				
Subtotal (base cost for infrastructure)				107.600
Contingencies and engineering				32.280
Total				139.880
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				96

#### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	65.600	328 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	42.000	210 JD/a
Subtotal (maintenance cost)			538 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.060.250	0	0 JD/a
Pumping (2020)	1.458.439	0	0 JD/a
Total operation cost (2010)			9.338 JD/a
Total operation cost (2020)			9.338 JD/a
Specific operation cost (2010)			0,009 JD/m <sup>3</sup>
Specific operation cost (2020)			0,006 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 2 Aqaba

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 1600 m <sup>3</sup> /h, H = 70 m)				
Civil works	1	1	284.000	284.000
Electromechanical equipment	1	1	284.000	284.000
Transmission main DN 400, DI	m	3.500	135	472.500
Transmission main DN 600, DI	m	5.500	205	1.127.500
Transmission main DN 500, DI	m	9.500	170	1.615.000
Reservoir 60,000 m <sup>3</sup>	1	2	450.000	900.000
Distribution network	ha	670	not considered	0
Others				
Subtotal (base cost for infrastructure)				4.683.000
Contingencies and engineering				1.404.900
Total				6.087.900
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				427

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	1.184.000	5.920 JD/a
Electromechanical equipment	2,0	284.000	5.680 JD/a
Mains, distribution network	0,5	3.215.000	16.075 JD/a
Subtotal (maintenance cost)			27.675 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	4	8.800	35.200 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	7.828.969	60	42.136 JD/a
Pumping (2020)	14.258.972	60	76.742 JD/a
Total operation cost (2010)			105.011 JD/a
Total operation cost (2020)			139.617 JD/a
Specific operation cost (2010)			0,013 JD/m <sup>3</sup>
Specific operation cost (2020)			0,010 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 5 Fuhis

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 300, concr.	m	200	70	14.000
Reservoir 0 m <sup>3</sup>	1	0	0	0
Distribution network	ha	85	not considered	0
Others				
Subtotal (base cost for infrastructure)				14.000
Contingencies and engineering				4.200
Total				18.200
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				17

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	0	0 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	14.000	70 JD/a
Subtotal (maintenance cost)			70 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	744.741	0	0 JD/a
Pumping (2020)	1.094.807	0	0 JD/a
Total operation cost (2010)			8.870 JD/a
Total operation cost (2020)			8.870 JD/a
Specific operation cost (2010)			0,012 JD/m <sup>3</sup>
Specific operation cost (2020)			0,008 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 6+16 Irbid Central and Wadi Arab

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 700, concr.	m	4.000	122	488.000
Reservoir 60,000 m <sup>3</sup>	1	1	450.000	450.000
Distribution network	ha	2.000	not considered	0
Others				
Subtotal (base cost for infrastructure)				938.000
Contingencies and engineering				281.400
Total				1.219.400
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				73

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	450.000	2.250 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	488.000	2.440 JD/a
Existing main: Irbid- Jordan Valle	0,5	2.430.000	12.150 JD/a
Subtotal (maintenance cost)			16.840 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	11.323.637	0	0 JD/a
Pumping (2020)	16.590.810	0	0 JD/a
Total operation cost (2010)			43.240 JD/a
Total operation cost (2020)			43.240 JD/a
Specific operation cost (2010)			0,004 JD/m <sup>3</sup>
Specific operation cost (2020)			0,003 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 8 Karak

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 300, conc	m	600	70	42.000
Transmission main DN 300, conc	m	900	70	63.000
Reservoir 9,000 m <sup>3</sup>	1	1	73.800	73.800
Distribution network	ha	60	not considered	0
Others				
Subtotal (base cost for infrastructure)				178.800
Contingencies and engineering				53.640
Total				232.440
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				164

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	73.800	369 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	105.000	525 JD/a
Subtotal (maintenance cost)			894 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	951.161	0	0 JD/a
Pumping (2020)	1.417.235	0	0 JD/a
Total operation cost (2010)			9.694 JD/a
Total operation cost (2020)			9.694 JD/a
Specific operation cost (2010)			0,010 JD/m <sup>3</sup>
Specific operation cost (2020)			0,007 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 9 Kufranja

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 400, concr	m	2.000	81	162.000
Reservoir 20,000 m <sup>3</sup>	1	1	156.000	156.000
Distribution network	ha	310	not considered	0
Others				
Subtotal (base cost for infrastructure)				318.000
Contingencies and engineering				95.400
Total				413.400
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				120

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	156.000	780 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	162.000	810 JD/a
Subtotal (maintenance cost)			1.590 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	2.005.676	0	0 JD/a
Pumping (2020)	3.439.852	0	0 JD/a
Total operation cost (2010)			19.190 JD/a
Total operation cost (2020)			19.190 JD/a
Specific operation cost (2010)			0,010 JD/m <sup>3</sup>
Specific operation cost (2020)			0,006 JD/m <sup>3</sup>



### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 10 Ma'an

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 160 m <sup>3</sup> /h, H = 15 m)				
Civil works	1	1	56.400	56.400
Electromechanical equipment	1	1	56.400	56.400
Transmission main DN 300, DI	m	200	95	19.000
Reservoir 9,000 m <sup>3</sup>	1	1	73.800	73.800
Distribution network	ha	100	not considered	0
Others				
Subtotal (base cost for infrastructure)				205.600
Contingencies and engineering				61.680
Total				267.280
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				191

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	130.200	651 JD/a
Electromechanical equipment	2,0	56.400	1.128 JD/a
Mains, distribution network	0,5	19.000	95 JD/a
Subtotal (maintenance cost)			1.874 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	755.401	15	1.016 JD/a
Pumping (2020)	1.399.761	15	1.883 JD/a
Total operation cost (2010)			20.490 JD/a
Total operation cost (2020)			21.357 JD/a
Specific operation cost (2010)			0,027 JD/m <sup>3</sup>
Specific operation cost (2020)			0,015 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 11 Madaba

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 435m <sup>3</sup> /h, H = 15 m)				
Civil works	1	1	130.500	130.500
Electromechanical equipment	1	1	130.500	130.500
Transmission main DN 400, DI	m	200	135	27.000
Reservoir 20,000 m <sup>3</sup>	1	1	156.000	156.000
Distribution network	ha	300	not considered	0
Others				
Subtotal (base cost for infrastructure)				444.000
Contingencies and engineering				133.200
Total				577.200
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				151

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	286.500	1.433 JD/a
Electromechanical equipment	2,0	130.500	2.610 JD/a
Mains, distribution network	0,5	27.000	135 JD/a
Subtotal (maintenance cost)			4.178 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	2.436.025	15	3.278 JD/a
Pumping (2020)	3.826.764	15	5.149 JD/a
Total operation cost (2010)			33.855 JD/a
Total operation cost (2020)			35.726 JD/a
Specific operation cost (2010)			0,014 JD/m <sup>3</sup>
Specific operation cost (2020)			0,009 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 12 Mafrq

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 350m <sup>3</sup> /h, H = 5 m)				
Civil works	1	1	105.000	105.000
Electromechanical equipment	1	1	105.000	105.000
Transmission main DN 400, DI	m	200	135	27.000
Reservoir 10,000 m <sup>3</sup>	1	1	82.000	82.000
Distribution network	ha	140	not considered	0
Others				
Subtotal (base cost for infrastructure)				319.000
Contingencies and engineering				95.700
Total				414.700
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				268

##### Operation cost

Maintenance cost	Percentage	Invest cost JD	Cost JD/a
Civil works	0,5	187.000	935 JD/a
Electromechanical equipment	2,0	105.000	2.100 JD/a
Mains, distribution network	0,5	27.000	135 JD/a
Subtotal (maintenance cost)			3.170 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.058.218	5	475 JD/a
Pumping (2020)	1.549.250	5	695 JD/a
Total operation cost (2010)			21.245 JD/a
Total operation cost (2020)			21.465 JD/a
Specific operation cost (2010)			0,020 JD/m <sup>3</sup>
Specific operation cost (2020)			0,014 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 13 Ramtha

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 335m <sup>3</sup> /h, H = 5 m)				
Civil works	1	1	100.500	100.500
Electromechanical equipment	1	1	100.500	100.500
Transmission main DN 400, DI	m	500	135	67.500
Reservoir 18,000 m <sup>3</sup>	1	1	140.400	140.400
Distribution network	ha	180	not considered	0
Others				
Subtotal (base cost for infrastructure)				408.900
Contingencies and engineering				122.670
Total				531.570
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				180

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	240.900	1.205 JD/a
Electromechanical equipment	2,0	100.500	2.010 JD/a
Mains, distribution network	0,5	67.500	338 JD/a
Subtotal (maintenance cost)			3.552 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.704.621	5	765 JD/a
Pumping (2020)	2.946.989	5	1.322 JD/a
Total operation cost (2010)			30.717 JD/a
Total operation cost (2020)			31.274 JD/a
Specific operation cost (2010)			0,018 JD/m <sup>3</sup>
Specific operation cost (2020)			0,011 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 15 Tafielah

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 130m <sup>3</sup> /h, H = 25 m)				
Civil works	1	1	45.825	45.825
Electromechanical equipment	1	1	45.825	45.825
Transmission main DN 300, DI	m	1.000	95	95.000
Reservoir 7,000 m <sup>3</sup>	1	1	58.800	58.800
Distribution network	ha	50	not considered	0
Others				
Subtotal (base cost for infrastructure)				245.450
Contingencies and engineering				73.635
Total				319.085
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				275

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	104.625	523 JD/a
Electromechanical equipment	2,0	45.825	917 JD/a
Mains, distribution network	0,5	95.000	475 JD/a
Subtotal (maintenance cost)			1.915 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	838.258	25	1.880 JD/a
Pumping (2020)	1.159.795	25	2.601 JD/a
Total operation cost (2010)			21.394 JD/a
Total operation cost (2020)			22.115 JD/a
Specific operation cost (2010)			0,026 JD/m <sup>3</sup>
Specific operation cost (2020)			0,019 JD/m <sup>3</sup>

**Cost estimation for wastewater reuse facilities**

(Price basis 2000)

**17 Wadi Essir**

**Investment cost**

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 200, concr.	m	600	50	30.000
Reservoir 0 m <sup>3</sup>	1	0	0	0
Distribution network	ha	40	not considered	0
Others				
Subtotal (base cost for infrastructure)				30.000
Contingencies and engineering				9.000
Total				39.000
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				48

**Operation cost**

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	0	0 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	30.000	150 JD/a
Subtotal (maintenance cost)			150 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	532.045	0	0 JD/a
Pumping (2020)	805.046	0	0 JD/a
Total operation cost (2010)			8.950 JD/a
Total operation cost (2020)			8.950 JD/a
Specific operation cost (2010)			0,017 JD/m <sup>3</sup>
Specific operation cost (2020)			0,011 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 18 Wadi Hassan

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 250, DI	m	750	81	60.750
Reservoir 5,000 m <sup>3</sup>	1	0	0	0
Distribution network	ha	50	not considered	0
Others				
Subtotal (base cost for infrastructure)				60.750
Contingencies and engineering				18.225
Total				78.975
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				95

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	0	0 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	60.750	304 JD/a
Subtotal (maintenance cost)			304 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	547.801	0	0 JD/a
Pumping (2020)	833.660	0	0 JD/a
Total operation cost (2010)			9.104 JD/a
Total operation cost (2020)			9.104 JD/a
Specific operation cost (2010)			0,017 JD/m <sup>3</sup>
Specific operation cost (2020)			0,011 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 19 Wadi Mousa

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 300, concr.	m	200	70	14.000
Reservoir 9,000 m <sup>3</sup>	1	1	73.800	73.800
Distribution network	ha	80	not considered	0
Others				
Subtotal (base cost for infrastructure)				87.800
Contingencies and engineering				26.340
Total				114.140
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				71

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	73.800	369 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	14.000	70 JD/a
Subtotal (maintenance cost)			439 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.115.224	0	0 JD/a
Pumping (2020)	1.607.427	0	0 JD/a
Total operation cost (2010)			9.239 JD/a
Total operation cost (2020)			9.239 JD/a
Specific operation cost (2010)			0,008 JD/m <sup>3</sup>
Specific operation cost (2020)			0,006 JD/m <sup>3</sup>



### Cost estimation for wastewater reuse facilities

(Price basis 2000)

20 Al Jeeza

#### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 330m <sup>3</sup> /h, H = 25m)				
Civil works	1	1	99.000	99.000
Electromechanical equipment	1	1	99.000	99.000
Transmission main DN 400, DI	m	200	135	27.000
Reservoir 18,000 m <sup>3</sup>	1	1	140.400	140.400
Distribution network	ha	130	not considered	0
Others				
Subtotal (base cost for infrastructure)				365.400
Contingencies and engineering				109.620
Total				475.020
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				165

#### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	239.400	1.197 JD/a
Electromechanical equipment	2,0	99.000	1.980 JD/a
Mains, distribution network	0,5	27.000	135 JD/a
Subtotal (maintenance cost)			3.312 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.900.025	25	4.261 JD/a
Pumping (2020)	2.879.440	25	6.457 JD/a
Total operation cost (2010)			33.973 JD/a
Total operation cost (2020)			36.169 JD/a
Specific operation cost (2010)			0,018 JD/m <sup>3</sup>
Specific operation cost (2020)			0,013 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 22 Dair Abi Said

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 200m <sup>3</sup> /h, H = 25m)				
Civil works	1	1	70.500	70.500
Electromechanical equipment	1	1	70.500	70.500
Transmission main DN 300, DI	m	1.800	95	171.000
Reservoir 10,000 m <sup>3</sup>	1	1	82.000	82.000
Distribution network	ha	100	not considered	0
Others				
Subtotal (base cost for infrastructure)				394.000
Contingencies and engineering				118.200
Total				512.200
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				298

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	152.500	763 JD/a
Electromechanical equipment	2,0	70.500	1.410 JD/a
Mains, distribution network	0,5	171.000	855 JD/a
Subtotal (maintenance cost)			3.028 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	0	25	0 JD/a
Pumping (2020)	1.717.489	25	3.851 JD/a
Total operation cost (2010)			0 JD/a
Total operation cost (2020)			24.479 JD/a
Specific operation cost (2010)			0,000 JD/m <sup>3</sup>
Specific operation cost (2020)			0,014 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 23 Dair Alla

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 270m <sup>3</sup> /h, H = 15m)				
Civil works	1	1	81.000	81.000
Electromechanical equipment	1	1	81.000	81.000
Transmission main DN 250, DI	m	200	81	16.200
Transmission main DN 300 (pressure m)	m	3.000	95	285.000
Reservoir 15,000 m <sup>3</sup>	1	1	118.500	118.500
Distribution network	ha	160	not considered	0
Others				
Subtotal (base cost for infrastructure)				581.700
Contingencies and engineering				174.510
Total				756.210
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				315

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	199.500	998 JD/a
Electromechanical equipment	2,0	81.000	1.620 JD/a
Mains, distribution network	0,5	301.200	1.506 JD/a
Subtotal (maintenance cost)			4.124 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.776.141	15	2.390 JD/a
Pumping (2020)	2.401.393	15	3.231 JD/a
Total operation cost (2010)			32.913 JD/a
Total operation cost (2020)			33.755 JD/a
Specific operation cost (2010)			0,019 JD/m <sup>3</sup>
Specific operation cost (2020)			0,014 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 25 Kofur Asad

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 400, concr.	m	1.500	81	121.500
Reservoir 20,000 m <sup>3</sup>	1	1	156.000	156.000
Distribution network	ha	190	not considered	0
Others				
Subtotal (base cost for infrastructure)				277.500
Contingencies and engineering				83.250
Total				360.750
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				87

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	156.000	780 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	121.500	608 JD/a
Subtotal (maintenance cost)			1.388 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	3.090.798	0	0 JD/a
Pumping (2020)	4.141.692	0	0 JD/a
Total operation cost (2010)			18.988 JD/a
Total operation cost (2020)			18.988 JD/a
Specific operation cost (2010)			0,006 JD/m <sup>3</sup>
Specific operation cost (2020)			0,005 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 26 Aqaba South Coast

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 60 m <sup>3</sup> /h, H = 20 m)				
Civil works	1	1	24.477	24.477
Electromechanical equipment	1	1	24.477	24.477
Transmission main DN 200, DI	m	1.500	67	100.500
Reservoir 5,000 m <sup>3</sup>	1	1	43.000	43.000
Distribution network	ha	30	not considered	0
Others				
Subtotal (base cost for infrastructure)				192.454
Contingencies and engineering				57.736
Total				250.190
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				458

##### Operation cost

Maintenance cost	Percentage	Invest. cost JD	Cost JD/a
Civil works	0,5	67.477	337 JD/a
Electromechanical equipment	2,0	24.477	490 JD/a
Mains, distribution network	0,5	100.500	503 JD/a
Subtotal (maintenance cost)			1.329 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	344.122	20	617 JD/a
Pumping (2020)	546.290	20	980 JD/a
Total operation cost (2010)			19.547 JD/a
Total operation cost (2020)			19.909 JD/a
Specific operation cost (2010)			0,057 JD/m <sup>3</sup>
Specific operation cost (2020)			0,036 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 27 Naur

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 300, conc	m	500	70	35.000
Reservoir 10,000 m <sup>3</sup>	1	1	82.000	82.000
Distribution network	ha	160	not considered	0
Others				
Subtotal (base cost for infrastructure)				117.000
Contingencies and engineering				35.100
Total				152.100
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				89

##### Operation cost

Maintenance cost	Percentage	Invest. cost JD	Cost JD/a
Civil works	0,5	82.000	410 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	35.000	175 JD/a
Subtotal (maintenance cost)			585 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	954.206	0	0 JD/a
Pumping (2020)	1.713.175	0	0 JD/a
Total operation cost (2010)			9.385 JD/a
Total operation cost (2020)			9.385 JD/a
Specific operation cost (2010)			0,010 JD/m <sup>3</sup>
Specific operation cost (2020)			0,005 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 28 North Queen Alia Airport

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 500, concr.	m	1.500	93	139.500
Reservoir 60,000 m <sup>3</sup>	1	1	450.000	450.000
Distribution network	ha	460	not considered	0
Others				
Subtotal (base cost for infrastructure)				589.500
Contingencies and engineering				176.850
Total				766.350
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				82

##### Operation cost

Maintenance cost	Percentage	Invest. cost JD	Cost JD/a
Civil works	0,5	450.000	2.250 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	139.500	698 JD/a
Subtotal (maintenance cost)			2.948 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	6.164.830	0	0 JD/a
Pumping (2020)	9.342.642	0	0 JD/a
Total operation cost (2010)			29.348 JD/a
Total operation cost (2020)			29.348 JD/a
Specific operation cost (2010)			0,005 JD/m <sup>3</sup>
Specific operation cost (2020)			0,003 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 29 North Jordan Valley

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 450 m <sup>3</sup> /h, H =115 m)				
Civil works	1	1	135.000	135.000
Electromechanical equipment	1	1	135.000	135.000
Transmission main DN 500, DI	m	1.100	93	102.300
Reservoir 12,000 m <sup>3</sup>	1	1	97.200	97.200
Distribution network	ha	500	not considered	0
Others				
Subtotal (base cost for infrastructure)				469.500
Contingencies and engineering				140.850
Total				610.350
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				150

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	232.200	1.161 JD/a
Electromechanical equipment	2,0	135.000	2.700 JD/a
Mains, distribution network	0,5	102.300	512 JD/a
Subtotal (maintenance cost)			4.373 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	2.795.832	115	28.840 JD/a
Pumping (2020)	4.068.588	115	41.970 JD/a
Total operation cost (2010)			59.613 JD/a
Total operation cost (2020)			72.742 JD/a
Specific operation cost (2010)			0,021 JD/m <sup>3</sup>
Specific operation cost (2020)			0,018 JD/m <sup>3</sup>



### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 30 Shuna South

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 260m <sup>3</sup> /h, H = 30m)				
Civil works	1	1	78.000	78.000
Electromechanical equipment	1	1	78.000	78.000
Transmission main DN 300, DI	m	3.000	95	285.000
Reservoir 12,000 m <sup>3</sup>	1	1	97.200	97.200
Distribution network	ha	90	not considered	0
Others				
Subtotal (base cost for infrastructure)				538.200
Contingencies and engineering				161.460
Total				699.660
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				310

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	175.200	876 JD/a
Electromechanical equipment	2,0	78.000	1.560 JD/a
Mains, distribution network	0,5	285.000	1.425 JD/a
Subtotal (maintenance cost)			3.861 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	1.674.526	30	4.506 JD/a
Pumping (2020)	2.254.796	30	6.068 JD/a
Total operation cost (2010)			34.767 JD/a
Total operation cost (2020)			36.329 JD/a
Specific operation cost (2010)			0,021 JD/m <sup>3</sup>
Specific operation cost (2020)			0,016 JD/m <sup>3</sup>

**Cost estimation for wastewater reuse facilities**

(Price basis 2000)

**31 Torra**

**Investment cost**

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 220m <sup>3</sup> /h, H = 25m)				
Civil works	1	1	77.550	77.550
Electromechanical equipment	1	1	77.550	77.550
Transmission main DN 300, DI	m	1.000	95	95.000
Reservoir 12,000 m <sup>3</sup>	1	1	97.200	97.200
Distribution network	ha	90	not considered	0
Others				
Subtotal (base cost for infrastructure)				347.300
Contingencies and engineering				104.190
Total				451.490
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				232

**Operation cost**

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	174.750	874 JD/a
Electromechanical equipment	2,0	77.550	1.551 JD/a
Mains, distribution network	0,5	95.000	475 JD/a
Subtotal (maintenance cost)			2.900 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	0	25	0 JD/a
Pumping (2020)	1.948.666	25	4.370 JD/a
Total operation cost (2010)			0 JD/a
Total operation cost (2020)			33.670 JD/a
Specific operation cost (2010)			0,000 JD/m <sup>3</sup>
Specific operation cost (2020)			0,017 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 33 Wadi Shallala

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 670m <sup>3</sup> /h, H = 20m)				
Civil works	1	1	77.550	77.550
Electromechanical equipment	1	1	77.550	77.550
Transmission main DN 300, DI	m	700	95	66.500
Reservoir 45,000 m <sup>3</sup>	1	1	337.500	337.500
Distribution network	ha	360	not considered	0
Others				
Subtotal (base cost for infrastructure)				559.100
Contingencies and engineering				167.730
Total				726.830
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				122

##### Operation cost

Maintenance cost	Percentage	Invest cost JD	Cost JD/a
Civil works	0,5	415.050	2.075 JD/a
Electromechanical equipment	2,0	77.550	1.551 JD/a
Mains, distribution network	0,5	66.500	333 JD/a
Subtotal (maintenance cost)			3.959 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	3	8.800	26.400 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	4.055.897	20	7.276 JD/a
Pumping (2020)	5.949.123	20	10.673 JD/a
Total operation cost (2010)			37.635 JD/a
Total operation cost (2020)			41.031 JD/a
Specific operation cost (2010)			0,009 JD/m <sup>3</sup>
Specific operation cost (2020)			0,007 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 35 Mazar - Muta - Adnaniya

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = m <sup>3</sup> /h, H = m)				
Civil works	1	0	0	0
Electromechanical equipment	1	0	0	0
Transmission main DN 250, concr.	m	2.000	60	120.000
Reservoir 7,000 m <sup>3</sup>	1	1	58.800	58.800
Distribution network	ha	75	not considered	0
Others				
Subtotal (base cost for infrastructure)				178.800
Contingencies and engineering				53.640
Total				232.440
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				242

##### Operation cost

Maintenance cost	Percentage	Invest.cost JD	Cost JD/a
Civil works	0,5	58.800	294 JD/a
Electromechanical equipment	2,0	0	0 JD/a
Mains, distribution network	0,5	120.000	600 JD/a
Subtotal (maintenance cost)			894 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	1	8.800	8.800 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	600.260	0	0 JD/a
Pumping (2020)	960.704	0	0 JD/a
Total operation cost (2010)			9.694 JD/a
Total operation cost (2020)			9.694 JD/a
Specific operation cost (2010)			0,016 JD/m <sup>3</sup>
Specific operation cost (2020)			0,010 JD/m <sup>3</sup>

### Cost estimation for wastewater reuse facilities

(Price basis 2000)

#### 36 Dead Sea East Coast

##### Investment cost

Component	Unit	Quantity	Unit cost (JD/unit)	Cost (JD)
Pump station (Q = 140m <sup>3</sup> /h, H = 40m)				
Civil works	1	1	49.350	49.350
Electromechanical equipment	1	1	49.350	49.350
Transmission main DN 300, DI	m	2.000	95	190.000
Reservoir 8,000 m <sup>3</sup>	1	1	65.600	65.600
Distribution network	ha	70	not considered	0
Others				
Subtotal (base cost for infrastructure)				354.300
Contingencies and engineering				106.290
Total				460.590
Specific investment cost (JD/1000m <sup>3</sup> /a effluent) related to 2020				372

##### Operation cost

Maintenance cost	Percentage	Invest. cost JD	Cost JD/a
Civil works	0,5	114.950	575 JD/a
Electromechanical equipment	2,0	49.350	987 JD/a
Mains, distribution network	0,5	190.000	950 JD/a
Subtotal (maintenance cost)			2.512 JD/a
Staff cost	Number	Staff cost JD/a	Cost JD/a
Required staff	2	8.800	17.600 JD/a
Energy cost	Discharge m <sup>3</sup> /a	Height m	Cost JD/a
Pumping (2010)	658.486	20	1.181 JD/a
Pumping (2020)	1.237.102	20	2.219 JD/a
Total operation cost (2010)			21.293 JD/a
Total operation cost (2020)			22.331 JD/a
Specific operation cost (2010)			0,032 JD/m <sup>3</sup>
Specific operation cost (2020)			0,018 JD/m <sup>3</sup>