

## 10. Cost Estimates

## BIRZAI

## CASE 1 - ANAEROBIC-AEROBIC-AERATION (A2O)

## CONSTRUCTION COST SUMMARY

	Amount (I. I. itas)	Remark
<b>Construction Cost</b>		
<b>Treatment Plant (secondary treatment process)</b>		
1 Structures	2,276,018	
1 Grit chamber	14,771	
2 Parshall flume	8,210	
3 Splitter Box	5,481	
4 Completion of structures of reaction tank and sedimentation tan	139,058	
5 Modification of sedimentation tank structure	127,461	
6 Final sedimentation tank	561,028	
7 Sludge thickener	89,926	
8 Sludge storage tank	72,311	
9 Sludge treatment building	157,300	
10 Sludge storage yard	482,646	
11 Administration building	587,853	
12 Miscellaneous structures	30,000	
2 Earth Work	9,796	
3 In-plant Piping	135,348	
4 Site Development	537,123	
5 Water Supply Facility	100,000	
6 Landscaping	50,000	
7 Plant Equipment	4,550,000	
<b>Treatment plant (secondary treatment process)</b>	<b>7,658,315</b>	

detail

**BIRZAI**  
**CASE 1 - ANAEROBIC-AEROBIC-AERATION (A2O)**

**CONSTRUCTION COST DETAILS**

Item	unit	Quantity	unit cost	Amount	Remark
<b>1 Structures</b>					
1 Crtt chamber					
Foundation	m2	24.0	55	1,320	foundation base
Concrete Works (incl. Re-bar)	m3	4.8	878	4,214	site concrete
Base Slab	m3	5.6	1,196	6,698	site concrete
Wall	m3	1.0	1,196	1,196	site concrete
Miscellaneous (10% of above)	L.S.			1,343	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	sub-total			14,771	
<b>2 Parshall flume</b>					
Foundation	m2	10.0	55	548	foundation base
Concrete Works (incl. Re-bar)	m3	2.0	878	1,749	site concrete
Base Slab	m3	3.3	1,196	3,971	site concrete
Wall	m3	1.0	1,196	1,196	site concrete
Miscellaneous (10% of above)	L.S.			746	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	sub-total			8,210	
<b>3 Splitter Box</b>					
Foundation	m2	7.7	55	422	foundation base
Concrete Works (incl. Re-bar)	m3	1.5	878	1,349	site concrete
Base Slab	m3	2.7	1,196	3,215	site concrete
Wall	m3	0.0	1,196	0	site concrete
Miscellaneous (10% of above)	L.S.			499	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	sub-total			5,484	
<b>4 Completion of structures of reaction tank and sedimentation tank</b>					
Foundation	m2	644.0	55	35,420	foundation base
Concrete Works (incl. Re-bar)	m3	94.0	878	82,532	site concrete
Base Slab	m3	22.0	1,196	26,312	site concrete
Wall	m3	12.0	1,196	14,352	site concrete
Miscellaneous (10% of above)	L.S.			15,862	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	sub-total			139,058	



detail

**BIRZAI**  
**CASE 1 - ANAEROBIC-AEROBIC-AERATION (A20)**

**CONSTRUCTION COST DETAILS**

Item	unit	Quantity	unit cost	Amount	Remark
<b>5 Modification of sedimentation tank structure converted to Equipment room</b>					
Foundation	m2	486	55	26,730	foundation base
Concrete Works (incl. Re-bar)	m3	19	878	16,682	site concrete
Base Slab	m3	1	878	878	site concrete
Miscellaneous (10% of above)	m3	680	10	6,460	
Sand filling					
Pre-Cast Concrete Panel Work	m2	486	134	65,124	pre-cast slab panel
Top slab	L.S.	1		11,587	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)				127,461	
<b>sub-total</b>					
<b>6 Final sedimentation tank</b>					
Foundation	m2	968	55	53,240	foundation base
Concrete Works (incl. Re-bar)	m3	290	878	254,971	site concrete
Base Slab	m3	29	878	25,462	site concrete
Miscellaneous (10% of above)					
Pre-Cast Concrete Panel Work	m2	528	334	176,352	pre-cast wall panel
Wall	L.S.	1		51,003	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)				561,028	
<b>sub-total</b>					
<b>7 Sludge thickener</b>					
Foundation	m2	57.8	55	3,177	foundation base
Concrete Works (incl. Re-bar)	m3	17.3	878	15,214	site concrete
Base Slab	m3	36.4	1,196	43,564	site concrete
Wall	m3	11.6	1,196	13,816	site concrete
Top slab	m3	5.0	1,196	5,980	site concrete
Miscellaneous (10% of above)				8,175	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	L.S.	1		89,926	
<b>sub-total</b>					

detail

**BIRZAI**  
**CASE 1 - ANAEROBIC-AEROBIC-AERATION (A20)**

**CONSTRUCTION COST DETAILS**

Item	W (m)	L (m)	H (m)	A (m <sup>2</sup> )	unit	Quantity	unit cost	Amount	Remark
8 Sludge storage tank									
Foundation	4.6	7.6		35.0	m2	35.0	55	1,925	foundation base
Concrete Works (incl. Re-bar)	4.6	7.6	0.3	10.5	m3	10.5	878	9,208	site concrete
Base Slab	0.25	31	4.7	36.4	m3	36.4	1,196	43,564	site concrete
Wall	4.6	4.6	0.2	4.2	m3	4.2	1,196	5,061	site concrete
Top slab				5.0	m3	5.0	1,196	5,980	site concrete
Miscellaneous (10% of above)					L.S.	1		6,574	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)								72,311	
sub-total									
9 Sludge treatment building					m2	130	1,210	157,300	
10 Sludge storage yard									
Foundation	12.1	24.0		290.4	m2	290.4	55	15,972	foundation base
Concrete base (d=0.2 m)	12.1	24.0	0.2	58.1	m3	58.1	878	50,994	pre-cast slab panel
Roofing	12.1	24.0		290.4	m2	290.4	1,390	403,656	steel frame, tin-plate roofing
Pre-cast side wall panel		36.0	1.0	36.0	m2	36.0	334	12,024	
sub-total								482,646	
11 Administration building					m2	441	1,333	587,853	



**BIRZAI**  
**CASE 1 - ANAEROBIC-AEROBIC-AERATION (A20)**

**CONSTRUCTION COST DETAILS**

Item	unit	Quantity	unit cost	Amount	Remark
12 Miscellaneous structures					
sand bed					
Wastewater pit	L.S.			30,000	
2 Earth Work					
1 Excavation					
1 Final sedimentation tank	m3	985	2.15	2,118	
2 Sludge lagoon	m3	1,740	2.15	3,741	
2 Backfill to the existing ground					
1 Final sedimentation tank	m3	142	5.35	760	
3 Fill above the existing ground (use excess soil from excavation)	m3	2,583	1.23	3,177	= balance of excavation and backfill
sub-total				9,796	
3 In-plant Piping (all pipes laid in 1.0 m depth )					
use from					
1 Sewage	m	60	302	18,120	dia. material
2 Sewage	m	5	156	780	300 mm DIP
3 Sewage	m	50	351	17,550	400 mm RCP
4 Sewage	m	80	156	12,480	300 mm Culvert
5 Treated sewage	m	80	201	16,080	400 mm RCP
6 Secondary sludge	m	75	87	6,525	300 mm RCP
7 Thickened sludge	m	15	87	1,305	100 mm PVC
8 Return sludge	m	110	118	12,980	100 mm PVC
9 Return supernatant	m	45	87	3,915	200 mm PVC
10 Return supernatant	m	65	87	5,655	100 mm PVC
11 Scum	m	50	87	4,350	100 mm PVC
12 Return wastewater	m	150	87	13,050	100 mm PVC
13 Miscellaneous Works (20 % of the Total Cost of In-plant Pipings)				22,558	100 mm PVC
sub-total				135,348	

detail

BIRZAI  
CASE 1 - ANAEROBIC-AEROBIC-AERATION (A20)

CONSTRUCTION COST DETAILS					
Item					
	unit	Quantity	unit cost	Amount	Remark
4 Site Development					
1 Fence	m	710	98	69,580	
2 Gate	unit	1	1,951	1,951	
3 In-plant Road (w = 4 m, asphalt pavement)	m2	3,380	112	378,560	
4 Yard Lighting	L.S.	1	87,032	87,032	
				537,123	
sub-total					
5 Plant Equipment					

**BIRZAI****CASE 2 - OXIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE****CONSTRUCTION COST SUMMARY**

	Amount (Litas)	Remark
<b>Construction Cost</b>		
<b>Treatment Plant (secondary treatment process)</b>		
1 Structures	4,586,944	
1 Grit chamber	14,771	
2 Parshall flume	8,210	
3 Spitter box	5,484	
4 Oxidation ditch	2,475,743	
5 Sludge pump house	101,673	
6 Final sedimentation tank	561,028	
7 Sludge thickener	89,926	
8 Sludge storage tank	72,311	
9 Sludge treatment building	157,300	
10 Sludge storage yard	482,646	
11 Administration building	587,853	
12 Miscellaneous structures	30,000	
2 Earth Work	12,069	
3 In-plant Piping	84,384	
4 Site Development	537,123	
5 Water Supply Facility	100,000	
6 Landscaping	50,000	
7 Plant Equipment	4,182,000	
<b>Treatment plant (secondary treatment process)</b>	<b>9,552,520</b>	
<b>Total Construction Cost</b>	<b>9,552,520</b>	



BIRZAI  
CASE 2 - ONIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE

CONSTRUCTION COST DETAILS

Item	unit	Quantity	unit cost	Amount	Remark
1 Structures					
1 Grit chamber					
Foundation	m2	24.0	55	1,320	foundation base
Concrete Works (incl. Re-bar)	m3	4.8	878	4,214	site concrete
Base Slab	m3	5.6	1,196	6,698	site concrete
Wall	m3	1.0	1,196	1,196	site concrete
Miscellaneous (10% of above)	L.S.	1		1,343	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)				14,771	
sub-total					
2 Parshall flume					
Foundation	m2	10.0	55	548	foundation base
Concrete Works (incl. Re-bar)	m3	2.0	878	1,749	site concrete
Base Slab	m3	3.3	1,196	3,971	site concrete
Wall	m3	1.0	1,196	1,196	site concrete
Miscellaneous (10% of above)	L.S.	1		746	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)				8,210	
sub-total					
3 Spitter box					
Foundation	m2	7.7	55	422	foundation base
Concrete Works (incl. Re-bar)	m3	1.5	878	1,349	site concrete
Base Slab	m3	2.7	1,196	3,215	site concrete
Wall	m3	0.0	1,196	0	site concrete
Miscellaneous (10% of above)	L.S.	1		499	
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)				5,484	
sub-total					

detail

**BIRZAI**  
**CASE 2 - OXIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE**

**CONSTRUCTION COST DETAILS**

Item	unit	Quantity	unit cost	Amount	Remark
<b>4 Oxidation ditch</b>					
Foundation					
Concrete Works (incl. Re-bar)	m2	4,000.0	55	220,000	foundation base
Base Slab	m3	1,600.0	878	1,404,800	site concrete
Outer Wall (curved w	m3	149.1	1,196	178,324	site concrete
Miscellaneous (10% of other concrete volume)	m3	175.0	1,196	209,300	site concrete
<b>Pre-Cast Concrete Panel Work</b>					
Outer Wall	m2	315	334	105,210	pre-cast wall panel
Partition wall	m2	210	98	20,580	pre-cast wall panel
Base slab	m2	163	134	21,775	pre-cast wall panel
Top slab	m2	163	73	11,863	pre-cast wall panel
Wall	m2	236	334	78,824	pre-cast wall panel
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	L.S.	1		225,068	
<b>sub-total</b>				<b>2,475,743</b>	
<b>5 Sludge pump house</b>					
Foundation					
Concrete Works (incl. Re-bar)	m2	95	55	5,198	foundation base
Base Slab	m3	19	878	16,682	site concrete
Miscellaneous (10% of above)	m3	4	878	3,512	site concrete
<b>Pre-Cast Concrete Panel Work</b>					
Top slab	m2	95	134	12,663	pre-cast slab panel
Underground wall	m2	163	334	54,375	pre-cast wall panel
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	L.S.	1		9,243	
<b>sub-total</b>				<b>101,673</b>	
<b>6 Final sedimentation tank</b>					
Foundation					
Concrete Works (incl. Re-bar)	m2	968	55	53,240	foundation base
Base Slab	m3	290	878	254,971	site concrete
Miscellaneous (10% of above)	m3	29	878	25,462	site concrete
<b>Pre-Cast Concrete Panel Work</b>					
Wall	m2	528	334	176,352	pre-cast wall panel
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)	L.S.	1		51,003	
<b>sub-total</b>				<b>561,028</b>	

detail

BIRZAI  
CASE 2 - OXIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE

## CONSTRUCTION COST DETAILS

Item	W (m)	L (m)	H (m)	A (m <sup>2</sup> )	unit	Quantity	unit cost	Amount	Remark
<b>7 Sludge thickener</b>									
Foundation	7.6	7.6		57.8	m <sup>2</sup>	57.8	55	3,177	foundation base
Concrete Works (incl. Re-bar)	7.6	7.6	0.3	17.3	m <sup>3</sup>	17.3	878	15,214	site concrete
Base Slab	7.6	7.6	0.3	17.3	m <sup>3</sup>	17.3	878	15,214	site concrete
Wall	0.25	31.0	4.7	36.4	m <sup>3</sup>	36.4	1,196	43,564	site concrete
Top slab	7.6	7.6	0.2	11.6	m <sup>3</sup>	11.6	1,196	13,816	site concrete
Miscellaneous (10% of above)				5.0	m <sup>3</sup>	5.0	1,196	5,980	site concrete
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)					L.S.	1		8,175	
sub-total								89,926	
<b>8 Sludge storage tank</b>									
Foundation	4.6	7.6		35.0	m <sup>2</sup>	35.0	55	1,923	foundation base
Concrete Works (incl. Re-bar)	4.6	7.6	0.3	10.5	m <sup>3</sup>	10.5	878	9,208	site concrete
Base Slab	4.6	7.6	0.3	10.5	m <sup>3</sup>	10.5	878	9,208	site concrete
Wall	0.25	31	4.7	36.4	m <sup>3</sup>	36.4	1,196	43,564	site concrete
Top slab	4.6	4.6	0.2	4.2	m <sup>3</sup>	4.2	1,196	5,061	site concrete
Miscellaneous (10% of above)				5.0	m <sup>3</sup>	5.0	1,196	5,980	site concrete
Miscellaneous works (handrail, metal work etc. = 10% of the cost of above)					L.S.	1		6,574	
sub-total								72,311	
<b>9 Sludge treatment building</b>									
Foundation					m <sup>2</sup>	130	1,210	157,300	
<b>10 Sludge storage yard</b>									
Foundation	12.1	24.0		290.4	m <sup>2</sup>	290.4	55	15,972	foundation base
Concrete base (d=0.2 m)	12.1	24.0	0.2	58.1	m <sup>3</sup>	58.1	878	50,994	pre-cast slab panel
Roofing	12.1	24.0		290.4	m <sup>2</sup>	290.4	1,390	403,656	steel frame, tin-plate roofing
Pre-cast side wall panel	36.0	1.0		36.0	m <sup>2</sup>	36.0	334	12,024	
sub-total								482,646	

**BIRZAI**  
**CASE 2 - OXIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE**

**CONSTRUCTION COST DETAILS**

Item	unit	Quantity	unit cost	Amount	Remark
11 Administration building	m2	441	1,333	587,853	
12 Miscellaneous structures					
sand bed					
Wastewater pit	L.S.			30,000	
2 Earth Work					
1 Excavation					
1 Oxidation ditch	m3	1,920	2.15	4,128	
2 Final sedimentation tank	m3	800	2.15	1,720	
3 Sludge thickener	m3	100	2.15	215	
4 Sludge storage tank	m3	100	2.15	215	
5 Sludge treatment building	m3	20	2.15	43	
6 Sludge storage yard	m3	50	2.15	108	
7 Administration building	m3	20	2.15	43	
2 Backfill to the existing ground					
1 Oxidation ditch	m3	250	5.35	1,338	
2 Final sedimentation tank	m3	150	5.35	803	
3 Sludge thickener	m3	20	5.35	107	
4 Sludge storage tank	m3	10	5.35	54	
5 Sludge treatment building	m3	10	5.35	54	
6 Sludge storage yard	m3	10	5.35	54	
7 Administration building	m3	10	5.35	54	
3 Fill above the existing ground (use excess soil from excavation)	m3	2,550	1.23	3,137	= balance of excavation and backfill max. height = 2.0 m
sub-total				12,069	

detail

**BIRZAI**  
**CASE 2 - OXIDATION DITCH AT THE EXISTING TREATMENT PLANT SITE**

**CONSTRUCTION COST DETAILS**

Item		unit	Quantity	unit cost	Amount	Remark
3 In-plant Piping (all pipes laid in 1.0 m depth )						
use	from					
1 Sewage	End of the existing pressure line	m	20	302	6,040	dia. 300 mm material: DIP
2 Sewage	Grit chamber	m	10	156	1,560	RCP
2 Sewage	Parshall flume	m	50	351	17,550	Culvert
2 Sewage	Oxidation ditch	m	30	156	4,680	RCP
3 Sewage	Final sedimentation tank	m	50	156	7,800	RCP
4 Secondary sludge	Final sedimentation tank	m	20	108	2,160	PVC
5 Thickened sludge	Sludge thickener	m	5	108	540	PVC
6 Return sludge	Sludge pump room (at OD)	m	80	118	9,440	PVC
7 Return supernatant	Sludge thickener	m	50	108	5,400	PVC
8 Return supernatant	Control building (dewatering)	m	50	108	5,400	PVC
9 Scum	Final sedimentation tank	m	50	108	5,400	PVC
10 Return wastewater	Wastewater pit	m	50	87	4,350	PVC
11 Miscellaneous Work	(20% of the total in-plant pipe work)				14,064	
sub-total					84,384	
4 Site Development						
1 Fence		m	710	98	69,580	
2 Gate		unit	1	1,951	1,951	
3 In-plant Road (w = 4 m, asphalt pavement)		m <sup>2</sup>	3,380	112	378,560	
4 Yard Lighting		L.S.	1	87,032	87,032	
sub-total					537,123	
5 Plant Equipment						

Birzai Treatment Plant  
Tertiary Treatment System

Structural Works

		unit	quantity	unit cost	Amount
1	Foundation	m3	32	757	24,211
2	Reinforcing Wall	m3	60	1,173	70,356
3	Brick Wall (40 cm)	m2	72	247	17,784
4	Pillar Foundation	m3	9	757	6,809
5	Pre-Cast Pillar	m3	7.7	1,595	12,282
6	Steel Beam	ton	2.3	7,835	18,021
7	Pre-Cast Recovering (RF)	m3	10.2	1,200	12,239
8	Pre-Cast Recovering (1F)	m3	4.5	1,200	5,400
9	Roof	m2	128	268	34,278
10	Pre-cast Stairs	m3	2	1,119	2,239
11	Blower Foundation	m3	1.3	486	632
12	Doors	m2	4.5	1,671	7,517
13	Windows	m2	7.2	619	4,455
14	Interior Work	L.S.	1		63,776
				Total	280,000

Birzai  
Effluent Pipe Cost Estimates

Length= 7,000		material		
Item	labor	material	equipment	total
<b>Summary of Work</b>				
Pavement demolition/restoration	45,411	61,031	775,148	881,590
Pipeline Construction Work	586,113	3,620,082	1,314,259	5,520,454
River Crossing Civil Work	27,486	155,740	76,862	260,089
Temporary road for construction	28,048	397,296	237,890	663,233
Grand Total	687,058	4,234,149	2,404,159	7,325,366
<b>unit cost per meter of length</b>	<b>98</b>	<b>605</b>	<b>343</b>	<b>1,046</b>

Item	labor	material	equipment	total
<b>Pavement demolition/restoration</b>				
direct construction cost	18,127	45,650	579,793	643,570
indirect cost	27,284	15,381	195,355	238,020
Sub-total Construction cost	45,411	61,031	775,148	881,590
<b>Pipeline Construction Work</b>				
Earth work	102,036	112	729,320	831,468
dewatering	-	-	128,275	128,275
Pipe foundation	11,539	68,600	3,773	83,912
Pipe/valve material and installatic	55,191	2,287,453	56,269	2,398,913
Manhole Construction Work	21,162	91,502	11,018	123,682
Oher work	9,530	131,130	7,569	148,229
direct construction cost	199,458	2,578,797	936,224	3,714,479
indirect cost	386,655	1,041,285	378,035	1,805,975
Sub-total Construction cost	586,113	3,620,082	1,314,259	5,520,454
<b>River Crossing Civil Work</b>				
direct construction cost	10,972	116,490	57,491	184,953
indirect cost	16,514	39,250	19,371	75,136
Sub-total Construction cost	27,486	155,740	76,862	260,089
<b>Temporary road for construction</b>				
direct construction cost	11,196	297,168	177,936	486,300
indirect cost	16,852	100,128	59,954	176,933
Sub-total Construction cost	28,048	397,296	237,890	663,233

UAB "Ekoprojektas"

Objektinė sąmata Nr.: 1  
Sudaryta 1998.07.01 kainų lygiu

Komplek E-0001 Orientacinė statybos kaina  
Objektas Biržai ( Sewerage-Main SK-5 )

Eil. Nr.	Sąmatos kodas	Lokalinės sąmatos pavadinimas	Tiesioginės išlaidos (t. Lt)			Sąmatinė kaina (t. Lt)		
			Darbo užmokestis	Medžiagos	Mechaniz- mai	Statybos ir montavimo darbai	Įrengimai	Viso
1	2	3	4	5	6	7	8	9
1	1	Destroying-Rebuilding Works	18.127	45.650	579.793	881.515		881.515
2	2	Outer Sewerge	232.117	3181.644	975.320	6138.121		6138.121
3	3	Diuker	10.972	116.490	57.941	260.643		260.643
4	4	Temporary Road	11.196	297.168	177.936	663.188		663.188
		Iš viso	272.412	3640.953	1790.990	7943.466		7943.466

Projekto vadovas \_\_\_\_\_

Sudarė \_\_\_\_\_ S.Posaškov



Sudaryta 1998.07.01 kainų lygiu.

Kompleksas: E-0001 Orientacinė statybos kaina

Objektas: Biržai (Sewerage -Main SK-5)

Žiniaraštis: Destroying-Rebuilding Works

Iš viso už **881 515 Lt**

Eil. Nr.	Darbo kodas	Darbų ir išlaidų aprašymai	Mato vnt	Kiekis	Tiesioginės išlaidos (Litais)			
					Darbas	Medžiagos	Mecha- nizmai	Iš viso
1	2	3	4	5	6	7	8	9
S9-Specifiniai darbai								71.88
S10-Sezoniniai darbai								2354.72
1	N27-37 (S9=1.085 S10=1.15)	Asfaltbetonio dangos 100 mm sluoksnio storio išardymas pneumopunktavimo pagalba	100 m <sup>3</sup>	0.18	230.06		485.10	715.16
2	N1-352 (S10=1.15)	Retų krūmų ir smulkaus miško nuvalymas nuo paviršiaus, kai gruntai natūralūs	ha	0.404	46.95		426.63	473.58
3	N1-94	I grupės grunto kasimas ir perstūmimas iki 10m atstumu 55 kW (75AJ) galios buldozeriais	1000 m <sup>3</sup>	38.1			17903.19	17903.19
4	N1-95 (K8=3)	Kiekvieniems sekantiems 10m, perstūmiant I grupės gruntą 55kW (75AJ) galios buldozeriais prie N1-94	1000 m <sup>3</sup>	38.1			49480.47	49480.47
5	N1-74 (S10=1.15)	I grupės grunto kasimas 0,25m <sup>3</sup> kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m <sup>3</sup>	38.1	5357.16		76285.35	81642.51
6	T1-53	I grupės grunto transportavimas 6t autosavivarčiais 1 km atstumu pakraunant 0,4m <sup>3</sup> kaušo talpos	100m <sup>3</sup>	381			124343.16	124343.16
7	N1-82 (S10=1.15)	Darbai sąvartoje, atvežant autosavivarčiais I grupės gruntą	1000 m <sup>3</sup>	38.1	839.72	39.03	5303.52	6182.27
8	N27-19 (S10=1.15)	Pagrindų išlyginamųjų ir paruošiamųjų sluoksnių iš smėlio įrengimas	100 m <sup>3</sup>	0.36	45.97	1197.07	92.12	1335.16
9	N27-86 (S10=1.15)	15 cm storio dvisl. dangos viršutinio sluoks. iš granit. skaldos 40-70 mm didesnio kaip 98,1 MPa atsparumo įrengimas	100 m <sup>2</sup>	1.8	60.59	4725.50	330.01	5116.10
10	N27-89 (S10=1.15)	15 cm storio dvisl. dangos apatinio sluoks. iš granit. skaldos 40-70 mm didesnio kaip 98,1 MPa atsparumo įrengimas	100 m <sup>2</sup>	1.8	53.54	4078.45	203.46	4335.45
11	N27-92 (K8=8)	Keičiant sluoksnio storį, kiekvienam sekantiem centimetrui prie normatyvų N27-83, N27-86, N27-89 pridėti arba atimti	100 m <sup>2</sup>	1.8		2170.57		2170.57

1	2	3	4	5	6	7	8	9
12	N27-190 (S9=1.17 S10=1.15)	4 cm storio dangos iš karštų poringų vidutinio grūdėtumo asfalto-betono mišinių įrengimas mechanizuotai	100 m <sup>2</sup>	1.8	66.19	2829.19	152.24	3047.62
13	N27-204 (K8=4 S9=1.17 S10=1.15)	Keičiant dangos storį, kiekvienam 0,5 cm prie normatyvo N27-190 pridėti arba atimti	100 m <sup>2</sup>	1.8	3.39	1408.56		1411.95
14	N27-162 (S9=1.17 S10=1.15)	6 cm storio juodos skaldos pagrindų įrengimas	100 m <sup>2</sup>	1.8	79.13	938.89	131.52	1149.54
15	N27-163 (K8=2)	Keičiant sluoksnio storį, kiekvienam sekančiam centimetrui prie normatyvų N27-161, N27-162 pridėti arba atimti	100 m <sup>2</sup>	1.8		286.07		286.07
16	N27-180 (S9=1.17 S10=1.15)	4 cm storio dangos iš karštų tankių B tipo markės I asfalto-betono-skaldos mišinių įrengimas mechanizuotai	100 m <sup>2</sup>	3.9	143.42	6412.72	329.86	6886.00
17	N27-194 (K8=3 S9=1.17 S10=1.15)	Keičiant dangos storį, kiekvienam 0,5 cm prie normatyvo N27-180 pridėti arba atimti	100 m <sup>2</sup>	3.9	5.52	2387.58		2393.10
18	N27-19 (S10=1.15)	Pagrindų išlyginamųjų ir paruošiamųjų sluoksnių iš smėlio įrengimas	100 m <sup>3</sup>	1.84	234.96	6118.37	470.82	6824.15
19	N27-43 (S10=1.15)	Viensluoksnių 12 cm storio pagrindų ir dangų iš smėlio-žvyro mišinių įrengimas	100 m <sup>2</sup>	9.2	302.47	4153.14	709.47	5165.08
20	N27-46 (K8=6)	Keičiant sluoksnio storį, kiekvienam sekančiam centimetrui prie normatyvų N27-43, N27-44, N27-45 pridėti arba atimti	100 m <sup>2</sup>	9.2		2061.65		2061.65
21	C1-891	Karjerinis žvyras	m <sup>3</sup>	-205		-6605.10		-6605.10
22	C1-890	Žvirgždas frakcinis	m <sup>3</sup>	205		10500.10		10500.10
23	N1-247	Iškasytų dugno bei šlaitų ir pylimų viršaus bei šlaitų planiravimas 66kW (90AJ) autogreideriais II grupės grunte	1000 m <sup>2</sup>	1.2			59.22	59.22
24	N1-390 (S10=1.15)	Šlaitų sutvirtinimas pasėjant daugiametes žoles ir paskleidžiant augalų sluoksnį rankiniu būdu	100 m <sup>2</sup>	12	1787.76	735.84		2523.60
25	N1-74 (S10=1.15)	I grupės grunto kasimas 0,25m <sup>3</sup> kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m <sup>3</sup>	38.1	5357.16		76285.35	81642.51
26	T1-53	I grupės grunto transportavimas 6t a/savivarčiais 1 km atstumu pakraunant 0,4m <sup>3</sup> kaušo talpos	100m <sup>3</sup>	381			124343.16	124343.16

1	2	3	4	5	6	7	8	9
27	N1-82 (S10=1.15)	Darbai sąvartoje, atvežant autosavivarčiais I grupės gruntą	1000 m <sup>3</sup>	38.1	839.72	39.03	5303.52	6182.27
28	N1-94	I grupės grunto kasimas ir perstūmimas iki 10m atstumu 55 kW (75AJ) galingumo buldozeriais	1000 m <sup>3</sup>	38.1			17903.19	17903.19
29	N1-95 (K8=3)	Kiekvieniems sekantiems 10m, perstumiant I grupės gruntą 55kW (75AJ) galingumo buldozeriais pridėti prie N1-94	1000 m <sup>3</sup>	38.1			49480.47	49480.47
30	N1-152	Pirminis paviršiaus planiravimas 55kW (75AJ) galingumo buldozeriais	1000 m <sup>2</sup>	127			2161.54	2161.54
Iš viso #1					15453.71	43476.66	552183.37	611 114 1.1
Pagalbinių medžiagų vertė						5.0%		2 174 1.1
Papildomų mechanizmų vertė							5.0%	27 609 1.1
Linijinio personalo uždarbis					17.3%			2 673 1.1
Iš viso #2					18127.20	45650.49	579792.54	643 570 1.1
Indeksas					1.00	1.00	1.00	
Po indeksacijos iš viso					18127.20	45650.49	579792.54	643 570 1.1
Pridėtinės išlaidos					70.0%			10 818 1.1
Soc. draudimas					30.0%			5 438 1.1
Kitos išlaidos					3.0%	3.0%	3.0%	19 307 1.1
Pelnas					10.0%	10.0%	10.0%	67 913 1.1
Iš viso #3								747 046 1.1
PVM					18%	18%	18%	134 468 1.1
Iš viso #4								881 515 1.1

Sudarė:

S.Posaškov

Sudaryta 1998.07.01 kainų lygiu.

Kompleksas: E-0001 Orientacinė statybos kaina  
 Objektas: Biržai ( Sewerage-Main SK5 )  
 Žiniaraštis: Outer Sewerge

Iš viso už 5 296 814 14

Eil. Nr.	Darbo kodas	Darbų ir išlaidų aprašymai	Mato vnt	Kiekis	Tiesioginės išlaidos (Litais)			
					Darbas	Medžiagos	Mecha- nizmai	Iš viso
1	2	3	4	5	6	7	8	9
S9-Specifiniai darbai								10365.58
S10-Sezoniniai darbai								26671.94
1	N1-69 (S10=1.15)	IV grupės grunto kasimas 0,5m3 kaušo talpos ekskavatoriais, pakraunant į	1000 m3	8.02	1601.43	24.65	24102.50	25728.58
2	N1-69 (K1=1.1 K2=1.1 S10=1.15)	IV grupės grunto kasimas 0,5m3 kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m3	0.39	85.66	1.20	1289.27	1376.13
3	N1-69 (K1=1.15 K2=1.15 S10=1.15)	IV grupės grunto kasimas 0,5m3 kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m3	1.905	437.45	5.85	6583.87	7027.17
4	N1-69 (K1=1.26 K2=1.26 S10=1.15)	IV grupės grunto kasimas 0,5m3 kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m3	0.34	85.54	1.04	1287.47	1374.05
5	N1-87 (K1=1.15 K2=1.15 S10=1.15)	Medinių, apkaustytų metalu, skydų po 0,8m3 kaušo talpos ekskav. įrengimas, perkėlimas ir priežiūra, kasant šlapią gruntą	1000 m3	0.685	156.82	34.50		191.32
6	N1-87 (K1=1.26 K2=1.26 S10=1.15)	Medinių, apkaustytų metalu, skydų po 0,8m3 kaušo talpos ekskav. įrengimas, perkėlimas ir priežiūra, kasant šlapią gruntą	1000 m3	0.085	21.32	4.28		25.60
7	N1-89 (K1=1.15 K2=1.15 S10=1.15)	Pakloto po autotransporto priemonėmis, kurių keliamoji galia iki 12t, įrengimas, kasant ekskavatoriais šlapią gruntą	1000 m3	0.685	152.36	35.80	76.57	264.73
8	N1-89 (K1=1.26 K2=1.26 S10=1.15)	Pakloto po autotransporto priemonėmis, kurių keliamoji galia iki 12t, įrengimas, kasant ekskavatoriais šlapią gruntą	1000 m3	0.085	20.71	4.44	10.41	35.56
9	T1-52	4 grupės grunto transportavimas 6t a/savivarčiais 1 km atstumu pakraunant 0,5m3 kaušo talpos	100m3	213.1			89054.49	89054.49
10	T1-61 (K8=34)	Transportuojant 3-4 grupės gruntą gerais keliais 6t a/savivarčiais už kiekvieną papildomą kilometrą pridėti	100m3	213.1			446968.73	446968.73

1	2	3	4	5	6	7	8	9
11	N1-19 (S10=1.15)	IV grupės grunto kasimas 0,5m <sup>3</sup> kaušo talpos ekskavatoriais, suverčiant į	1000 m <sup>3</sup>	20.99	3248.24		51719.36	54967.60
12	N1-19 (K1=1.1 K2=1.1 S10=1.15)	IV grupės grunto kasimas 0,5m <sup>3</sup> kaušo talpos ekskavatoriais, suverčiant į sankasą	1000 m <sup>3</sup>	0.445	75.75		1206.13	1281.88
13	N1-106	IV grupės grunto kasimas ir perstūmimas iki 10m atstumu 79kW (108AJ) galingumo buldozeriais	1000 m <sup>3</sup>	21.435			22635.36	22635.36
14	N1-107	Kiekvieniems sekantiems 10m, perstumiant IV grupės gruntą 79kW (108AJ) galingumo buldozeriais pridėti prie N1-106	1000 m <sup>3</sup>	21.435			10494.58	10494.58
15	N1-302 (K8=1.5 S10=1.15)	IV gr. grunto kasimas rank. būdu iki 2m pločio ir iki 2m gylio nesutvirtintose tranšėjose ir iki 1,5m gylio duobių kasimas	100 m <sup>3</sup>	6.1	29223.64			29223.64
16	N1-310 (S10=1.15)	Tranšėjų, iškasų ir duobių užpylimas IV grupės gruntu rankiniu būdu	100 m <sup>3</sup>	6.1	6849.20			6849.20
17	N1-136	Tranšėjų ir duobių užpylimas iš sankasos 55kW (75AJ) galingumo buldozeriais, perstumiant III grupės gruntą iki 5m atstumu	1000 m <sup>3</sup>	31.2			11659.44	11659.44
18	N1-137 (K8=3)	Kiekvieniems sekantiems 5m, perstumiant III grupės gruntą 55kW (75AJ) galingumo buldozeriais pridėti prie N1-136	1000 m <sup>3</sup>	31.2			15238.08	15238.08
19	N1-382 (S9=1.17 S10=1.15)	III - IV grupės grunto plūkimas elektroplūktuvais	100 m <sup>3</sup>	315.1	60077.56		46997.17	107074.73
20	c1-m240	Vandens siurbliui su vidaus degimo varikliu	maš/val	4896			128275.20	128275.20
21	N27-19 (S10=1.15)	Pagrindų išlyginamųjų ir paruošiamųjų sluoksnių iš smėlio įrengimas	100 m <sup>3</sup>	14.5	1851.59	48215.40	3710.26	53777.25
22	N23-1 (S10=1.15)	Smėlio pagrindo po vamzdynais įrengimas	m <sup>3</sup>	480	8427.94	15180.48		23608.42
23	N23-5 (S10=1.15)	Betoninio pagrindo po vamzdynais įrengimas šlapiame grunte	m <sup>3</sup>	0.75	16.76	141.26	13.67	171.69
24	N23-7 (S10=1.15)	Gelžbetoninio pagrindo po vamzdynais įrengimas šlapiame grunte	m <sup>3</sup>	2.55	65.77	476.82	48.54	591.13
25	N23-2 (S10=1.15)	Skaldos pagrindo po vamzdynais įrengimas	m <sup>3</sup>	67	1176.40	4586.82		5763.22
Skyrius Pipe								

1	2	3	4	5	6	7	8	9
26	PP-400	Pipe & Fittings	I.S.	1	55191.77	2287452.96	56269.49	2398914.22
		Iš viso už skyrių Pipe			55191.77	2287452.96	56269.49	2398914.22
27	N1-302 (S10=1.15)	IV gr. grunto kasimas rank. būdu iki 2m pločio ir iki 2m gylio nesutvirtintose tranšėjose ir iki 1,5m gylio duobių kasimas	100 m3	0.4	1277.48			1277.48
28	N6-19 (S9=1.026 S10=1.15)	Betoniniai juostiniai pamatai atraminės rūšio sienos iki 300mm pločio, įrengiant	m3	10.4	908.76	148.77	189.70	1247.23
29	CI-320	Betonas	m3	10.56		1823.40		1823.40
30	N1-310 (S10=1.15)	Tranšėjų, iškasų ir duobių užpylimas IV grupės gruntu rankiniu būdu	100 m3	0.3	336.85			336.85
31	N1-382 (S9=1.17 S10=1.15)	III - IV grupės grunto plūkimas elektroplūktuvais	100 m3	0.3	57.20		44.75	101.95
32	N23-89 (S10=1.15)	Apvalių surenkamų gelžbetoninių d 1m kanalizacijos šulinių įrengimas	m3	16.25	2155.75	3216.37	1316.25	6688.37
33	N23-89 (S10=1.15)	Apvalių surenkamų gelžbetoninių d 1m kanalizacijos šulinių įrengimas	m3	1.71	226.85	338.46	138.51	703.82
34	N22-339 (S10=1.15)	Apvalūs surenkami gelžbetonio vandentiekio šuliniai sausuose gruntuose	m3	21.45	2195.11	1151.34	2171.81	5518.26
35	N22-339 (S10=1.15)	Apvalūs surenkami gelžbetonio vandentiekio šuliniai sausuose gruntuose	m3	35.64	3647.26	1913.00	3608.55	9168.81
36	N22-339 (S10=1.15)	Apvalūs surenkami gelžbetonio vandentiekio šuliniai sausuose gruntuose	m3	2.55	260.96	136.87	258.19	656.02
37	G-9107	Plokštės-dugnai/šulin#Kcd-10	vnt	13		1205.08		1205.08
38	G-9085	Plokštės-perdeng.šulin#Kcp1- 10-2	vnt	13		669.49		669.49
39	G-9056	Žiedai-šuliniam#Kc-10-9	vnt	26		3213.54		3213.54
40	G-9108	Plokštės-dugnai/šulin#Kcd-15	vnt	13		2544.05		2544.05
41	G-9058	Žiedai-šuliniam#Kc-15-9	vnt	26		5355.90		5355.90
42	G-9088	Plokštės-perdeng.šulin#Kcp1- 15-2	vnt	13		1807.61		1807.61
43	G-9109	Plokštės-dugnai/šulin#Kcd-20	vnt	12		3646.13		3646.13
44	G-9060	Žiedai-šuliniam#Kc-20-9	vnt	24		7292.26		7292.26
45	G-9094	Plokštės-perdeng.šulin#Kcp1- 20-2	vnt	12		3151.74		3151.74
46	G-9102	Plokštės-kelio/šuliniam#KcO-1	vnt	21		216.30		216.30
47	G-9053	Žiedai-šuliniam#Kc-7-3	vnt	14		360.49		360.49
48	G-9055	Žiedai-šuliniam#Kc-10-6	vnt	3		247.20		247.20
49	G-9102	Plokštės-kelio/šuliniam#KcO-1	vnt	52		535.59		535.59
50	G-9053	Žiedai-šuliniam#Kc-7-3	vnt	27		695.24		695.24
51	G-9055	Žiedai-šuliniam#Kc-10-6	vnt	1		82.40		82.40
52	CI13-823	Liukas šulinio sunkus	vnt	38		8802.70		8802.70

1	2	3	4	5	6	7	8	9
53	N27-222 (S10=1.15)	Kelio ženklų, vieno skydelio ant vieno metalinio stovo, betonuojant pamatą, įrengimas rankiniu būdu	vnt	39	785.75	841.51	156.39	1783.65
54	C1-979	Juodi suvirinti vand.-dujot.vamzdžiai diam. iki	t	0.346		1052.32		1052.32
55	N15-188	Metalinų iki 50mm skersmens vamzdžių aliejinis dažymas du kartus	100 m2	0.39	180.46	147.13		327.59
56	N1-69 (K1=1.1 K2=1.1 S10=1.15)	IV grupės grunto kasimas 0,5m3 kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m3	0.12	26.36	0.37	396.71	423.44
57	T1-52	4 grupės grunto transportavimas 6l a/savivarčiais 1 km atstumu pakraunant 0,5m3 kaušo talpos	100m3	1.2			501.48	501.48
58	N1-84 (S10=1.15)	Darbai sąvartoje, atvežant autosavivarčiais IV - V grupės gruntą	1000 m3	0.12	4.88	0.49	27.65	33.02
59	N11-40	20mm storio cementinis užtepas, atliekamas rankiniu	100 m2	0.1	27.23	34.20		61.43
60	N11-17 (S9=1.136)	Pirmas klijuotinės hidroizoliacijos sluoksnis, klijuojant rulonines medžiagas bitumine mastika rankiniu būdu	100m2	0.1	35.82	264.07		299.89
61	N11-19 (S9=1.136)	Sekantis klijuotinės hidroizoliacijos sluoksnis, klijuojant rulonines medžiagas bitumine mastika rankiniu būdu	100m2	0.1	15.68	150.56		166.24
62	N11-40	20mm storio cementinis užtepas, atliekamas rankiniu	100 m2	0.1	27.23	34.20		61.43
63	N23-117 (S9=1.017 S10=1.15)	Staciokampių monolitinių betoninių didesnio kaip 3m2 ploto kanalizacijos šulinių įrengimas šlapiuose gruntuose	m3	7.95	405.12	3646.96	160.99	4213.07
64	C1-326	Betonas hidrotechninis	m3	6.1		1571.79		1571.79
65	G-4002	Plokštės-perdang/kamer#pK24	vnt	1		232.77		232.77
66	G-4007	Plokštės-perdang/kamer#pK-24 I	vnt	1		208.47		208.47
67	G-9053	Žiedai šuliniams#Kc-7-3	vnt	1		25.75		25.75
68	C113-823	Liukas šulinio sunkus	vnt	1		231.65		231.65
69	C1-10	Armatūra	t	0.5		805.50		805.50
70	N6-143 (S9=1.043 S10=1.15)	Gelžbetoninių juostų padarymas be klojinių įrengimo	m3	0.45	20.80	8.78	8.21	37.79
71	C1-320	Betonas	m3	0.5		86.34		86.34
72	N22-263 (S9=1.119 S10=1.15)	Plieninių suvirintų fasoninių dalių d 300-800mm pastatymas	t	0.035	53.36	223.37	61.92	338.65

1	2	3	4	5	6	7	8	9
73	N22-284 (K4=0.5 S9=1.06 S10=1.15)	Vandentiekio plieninių sklendžių arba atbulinių vožtuvų d 160mm pastatymas	vnt	2	16.41	21.75		38.16
74	N6-152 (S9=1.145 S10=1.15)	Paviršių torkretavimas 20mm storio sluoksniu iki 4m aukščio tūriniuose įrenginiuose	m2	15	119.39	87.65	10.20	217.24
75	N6-153 (S9=1.145 S10=1.15)	Keičiant torkretavimo storį, kiekvieniems 5mm pagal įkainį N6 - 152 pridėti arba atimti	m2	15	13.43	19.93	2.04	35.40
76	N11-21 (S9=1.136)	Viensluoksni 2mm storio teptinė bituminės mastikos hidroizoliacija rankiniu būdu (mažų apimčių, verdant bitumą objekte)	100m2	0.05	12.34	62.99		75.33
77	N11-23 (S9=1.136)	Sekantis 1mm storio bituminės mastikos hidroizoliacijos sluoksnis, tepamas rankiniu	100m2	0.05	3.36	29.91		33.27
78	N11-40	20mm storio cementinis užtepamas, atliekamas rankiniu	100 m2	0.1	27.23	34.20		61.43
79	N11-41 (K8=2)	Kiekvieniems 5mm cementinio užtepo, atliekamo rankiniu būdu, storio pokyčio pridėti ar atimti pagal N11-40.	100 m2	0.1	5.61	17.10		22.71
80	N11-59	20mm storio cementinė danga, atliekant darbus rankiniu būdu.	100 m2	0.1	27.19	38.10		65.29
81	N1-136	Tranšėjų ir duobių užpylimas iš sankasos 55kW (75AJ) galingumo buldozeriais, perstumiant III grupės gruntą iki 5m atstumu	1000 m3	0.085			31.76	31.76
82	N1-382 (S9=1.17 S10=1.15)	III - IV grupės grunto plūkimas elektroplūktuvais	100 m3	0.85	162.06		126.78	288.84
83	N1-302 (K8=1.25 S10=1.15)	IV gr. grunto kasimas rank. būdu iki 2m pločio ir iki 2m gylio nesutvirtintose tranšėjose ir iki 1,5m gylio duobių kasimas	100 m3	0.55	2195.62			2195.62
84	N7-3	Pamatų blokų ir plokščių juostiniams pamatams montavimas, kai konstrukcijos masė iki 3,5t	vnt	6	41.02		100.80	141.82
85	N7-196	Vandent. ir kanalizac. tūrinių įrenginių iki 6m2 ploto sieninių plokščių montavimas, užtaisant vertikalias siūles betonu	m3	6.8	689.28	928.32	397.66	2015.26
86	N7-9	Rūsio sienų blokų, kurių masė iki 0,5t, montavimas	vnt	18	56.76	56.66	146.88	260.30
87	B-254	Blokai rūsių sienoms FBC9.3.6 - 75t	vnt	18		814.65		814.65
88	G-8025	Plokštės-atram sienoms #fC-18	vnt	6		3000.33		3000.33



1	2	3	4	5	6	7	8	9
89	G-8022	Plokštės-atram sienoms#CI-30	vnt	6		3494.72		3494.72
90	N6-47 (S9=1.043 S10=1.15)	Monolitinės gelžbetoninės kolonos, kurių aukštis iki 3m ir perimetras iki 1.5m	m3	0.9	161.01	22.42	38.88	225.31
91	N6-45 (S9=1.026 S10=1.15)	Tarpų tarp surenkamų blokų užbetonavimas, įrengiant klojinius iš skydų, paduodant medžiagas kranu	m3	1.1	146.25	11.80	17.95	176.00
92	CI-320	Betonas	m3	2.1		362.61		362.61
93	CI-10	Armatūra	t	0.045		72.50		72.50
94	N8-1 (S9=1.136 S10=1.15)	Vertikali dviejų sluoksnių teptinė bitumo mastikos hidroizoliacija	100 m2	0.45	32.40	195.65	64.96	293.01
95	N1-310 (S10=1.15)	Traušėjų, iškasų ir duobių užpylimas IV grupės gruntų rankiniu būdu	100 m3	0.45	505.27			505.27
96	N11-11	Betono pasluoksnis ant grunto, paduodant medžiagas kranu.	m3	6.6	96.94	1162.41	82.86	1342.21
97	N1-393 (S10=1.15)	Šlaitų tvirtinimas surenkamomis betoninėmis 16cm storio ir iki 1m2 ploto	100 m2	0.45	348.37	328.28	359.03	1035.68
98	N1-394 (K8=9 S10=1.15)	Kiekvienam surenkamų betoninių plokščių kuriomis tvirtinami šlaitai storio pokyčio cm pridėti ar atimti pagal N1-	100 m2	-0.45	-85.75	-6.79	-201.75	-294.29
99	G-8535	Plokštės	vnt	12		3028.20		3028.20
100	S-30	Pralaidos	m	45	3937.41	19597.50	795.96	24330.87
Iš viso #1					189929.42	2447666.55	928655.71	3 566 252 Lt
Pagalbinių medžiagų vertė						5.0%		122 383 Lt
Papildomų mechanizmų vertė							5.0%	46 433 Lt
Linijinio personalo uždarbis					17.3%			32 858 Lt
Iš viso #2					222787.20	2570049.88	975088.50	3 767 926 Lt
Indeksas					1.00	1.00	1.00	
Po indeksacijos iš viso					222787.20	2570049.88	975088.50	3 767 926 Lt
Pridėtinės išlaidos					70.0%			132 951 Lt
Soc. draudimas					30.0%			66 836 Lt
Kitos išlaidos					3.0%	3.0%	3.0%	113 038 Lt
Pelnas					10.0%	10.0%	10.0%	408 075 Lt
Iš viso #3								4 488 825 Lt
PVM					18%			807 989 Lt
Iš viso #4								5 296 814 Lt

Sudarė:

S.Posaškov

Sudaryta 1998.07.01 kainų lygiu.

Kompleksas: NUTEKAMOJO VANDENS VALYMO ĮRENGINIAI BIRŽUOSE

Objektas: 05 Magistralė SK-1

Žiniaraštis: 2 Išorės fekalinė kanalizacija

Iš viso už **3 360 252 Lt**

Eil. Nr.	Darbo kodas	Darbų ir išlaidų aprašymai	Mato vnt	Kiekis	Tiesioginės išlaidos (Litais)			
					Darbas	Medžiagos	Mechanizmai	Iš viso
1	2	3	4	5	6	7	8	9
1	N22-63	Vamzdynai iš d300mm ketinių slėginių vamzdžių, užtaisant įmovas guminiiais sandarinimo žiedais	m	7155	41930.80	15153.95	47637.99	104722.74
2	N22-63 (K1=1.15 K2=1.15)	Vamzdynai iš d300mm ketinių slėginių vamzdžių, užtaisant įmovas guminiiais sandarinimo žiedais	m	71	478.50	150.38	543.63	1172.51
3	U-10009U	Vamzdžiai d.300 f."Pont-a-mousson"	m	7226		2039321.72		2039321.72
4	N22-45	Vamzdynai iš d150mm ketinių slėginių vamzdžių, užtaisant įmovas smaluota virve ir asbestcementu	m	55	262.41	5216.64	291.12	5770.17
5	N22-71	Vamzdynai iš d300mm plieninių vamzdžių, su hidrauliniu išbandymu	m	7	38.32	14.69	69.47	122.48
6	N22-74	Vamzdynai iš d500mm plieninių vamzdžių, su hidrauliniu išbandymu	m	150	1497.31	711.86	2945.10	5154.27
7	N22-378	Plieninių vamzdžių d 300mm įtraukimas į dėklus	m	130	1251.38	1194.30		2445.68
8	N22-378 (K1=1.15 K2=1.15)	Plieninių vamzdžių d 300mm įtraukimas į dėklus	m	16	177.12	146.98		324.10
9	N22-385	Dėklų galų didesnio kaip d 400mm užtaisymas virve ir bitumu	vnt	6	403.82	1671.50		2075.32
10	C113-202	bt 2kp-bst 4kp ir bst 2ps-bst 4ps markės plieno tiesiasilūlai elektra suvirinti vamzdžiai su briaunele, išor.diam.=325mm, sien.stor. 6 mm	m	7		1087.48		1087.48
11	C113-228	Plieniniai elektra suvirinti spiraline siūle b ir d grupės vamzdžiai su briaunele (gost 10704-76), išor.diam.=530mm, sienel.stor. 8mm	m	150		50852.13		50852.13
12	N22-398	Labai sustiprinta bituminė-polimerinė plieninių d=500mm vamzdžių izoliacija	m	150	824.79	11729.06		12553.85

1	2	3	4	5	6	7	8	9
13	N22-395	Labai sustiprinta bituminė-polimerinė plieninių d=300mm vamzdžių izoliacija	m	7	23.30	335.54		358.84
14	N22-130	Normali bituminė-guminė plieninių vamzdinių d 500mm sandūrų ir fasoninių dalių izoliacija	1000 t.m	0.15	169.04	916.71		1085.75
15	N22-127	Normali bituminė-guminė plieninių vamzdinių d 300mm sandūrų ir fasoninių dalių izoliacija	1000 t.m	0.07	50.15	191.79		241.94
16	N23-22	Gelžbetoninių beslėgių įmovinių d 400mm vamzdžių	m	15	133.71	62.51	75.83	272.05
17	G-10134	Vamzdžiai- beslėg. movin. #PT4.50-2	vnt	3		792.41		792.41
18	N23-81	Betoninių ir gelžbetoninių d 400mm vamzdžių padengimas bitumine mastika	m	15	70.54	104.99		175.53
19	N22-386	Požeminių komunikacijų pakabinimas susikirtime su d iki 500mm vamzdynais gyvenvietėse ir pram. aikštelėse	1000 t.m	7.241	3511.65	5657.85		9169.50
20	N22-268	Vandentiekio ketinių sklendžių arba atbulinių vožtuvų d 50mm pastatymas	vnt	13	105.81	157.02		262.83
22	N22-272	Vandentiekio ketinių sklendžių arba atbulinių vožtuvų d 150mm pastatymas	vnt	12	196.28	541.03		737.31
23	S-10010S	Sklendė f."Pont-a-mousson" EURO 23 d.50	vnt	13		6000.80		6000.80
24	S-10014S	Sklendė f."Pont-a-mousson" EURO 23 d.150	vnt	12		17370.60		17370.60
25	C130-1793	Flanšai plien. plokšti iš plieno bct3cp2, bct3cp3 d50mm	vnt	26		808.60		808.60
26	C130-1798	Flanšai plien. plokšti iš pl. bct3cp2, bct3cp3 d150mm 1,6MPa	vnt	24		746.40		746.40
27	N22-260	Ketinių fasoninių dalių d 250-450mm pastatymas	t	8.8	2260.16	27798.15	3920.40	33978.71
28	N22-329	Flanšų privirinimas prie plieninių d 300mm vamzdinių	vnt	14	187.86	88.40	452.62	728.88
29	N22-322	Flanšų privirinimas prie plieninių d 50mm vamzdinių	vnt	13	37.05	1.14	103.35	141.54
30	C130-1776	Flanšai plieniniai d 50mm	vnt	13		493.25		493.25
31	C130-1784	Flanšai plieniniai d 300mm	vnt	14		10928.54		10928.54
32	C159-1160	Aklidangtis flanšinis plieninis bct3cp3 pu-1MPa d-300mm	vnt	13		1136.55		1136.55
33	N22-263	Plieninių suvirintų fasoninių dalių d 300-800mm pastatymas	t	0.13	154.03	829.63	229.98	1213.64

1	2	3	4	5	6	7	8	9
34	N6-6	Betono pagrindas po pamatais (mažoms apimtims), pervežant betoną karučiais	m3	12	304.43	2262.30		2566.73
35	N6-28	Betoniniai stulpiniai pamatai, įrengiant klojinius iš lentų (mažoms apimtims)	m3	13.5	999.79	495.44		1495.23
36	P60-600044	Betonas M 100	M3	12.18		2103.12		2103.12
37	P60-600046	Betonas M 200	M3	13.7		2365.58		2365.58
38	N22-293	Viengubų vantūų pastatymas	vnt	13	123.51	65.93		189.44
39	S-10013S	Vantuzas "Pont-a-moussuon" d.50	vnt	13		77948.00		77948.00
Iš viso #1					55191.76	2287452.97	56269.49	2 398 914 L1
Pagalbinių medžiagų vertė						2.0%		45 749 L1
Papildomų mechanizmų vertė							5.0%	2 813 L1
Linijinio personalo uždarbis					17.3%			9 548 L1
Iš viso #2					64739.93	2333202.03	59082.96	2 457 025 L1
Indeksas					1.00	1.00	1.00	
Po indeksacijos iš viso					64739.93	2333202.03	59082.96	2 457 025 L1
Pridėtinės išlaidos					70.0%			38 634 L1
Soc. draudimas					30.0%			19 422 L1
Kitos išlaidos					3.0%	3.0%	3.0%	73 711 L1
Pelnas					10.0%	10.0%	10.0%	258 879 L1
Iš viso #3								2 847 671 L1
PVM					18%			512 581 L1
Iš viso #4								3 360 252 L1

Sudarė:

Sudaryta 1998.07.01 kainų lygiu.

Kompleksas: E-0001 Orientacinė statybos kaina

Objektas: Biržiai

Žiniaraštis: Diuker

Iš viso už 260 643 Lt

Eit. Nr.	Darbo kodas	Darbų ir išlaidų aprašymai	Mato vnt	Kiekis	Fiziloginės išlaidos (Litais)			
					Darbas	Medžiagos	Mecha- nizmai	Iš viso
1	2	3	4	5	6	7	8	9
1	SF-01	Diuker	kompl	1	9353.38	110943.00	55182.00	175478.38
Iš viso #1					9353.38	110943.00	55182.00	175 478 Lt
Pagalbinių medžiagų vertė						5.0%		5 547 Lt
Papildomų mechanizmų vertė							5.0%	2 759 Lt
Linijinio personalo uždarbis					17.3%			1 618 Lt
Iš viso #2					10971.51	116490.15	57941.10	185 403 Lt
Indeksas					1.00	1.00	1.00	
Po indeksacijos iš viso					10971.51	116490.15	57941.10	185 403 Lt
Pridėtinės išlaidos					70.0%			6 547 Lt
Soc. draudimas					30.0%			3 291 Lt
Kitos išlaidos					3.0%	3.0%	3.0%	5 562 Lt
Pelnas					10.0%	10.0%	10.0%	20 080 Lt
Iš viso #3								220 884 Lt
PVM					18%			39 759 Lt
Iš viso #4								260 643 Lt

Sudarė:

S. Posaškov

Sudaryta 1998.07.01 kainų lygiu.



Kompleksas: E-0001 Orientacinė statybos kalva

Objektas: Biržai

Žiniaraštis: Temporary Road

Iš viso už 663 188 Lt

Eil. Nr.	Darbo kodas	Darbų ir išlaidų aprašymai	Mato vnt	Kiekis	Tiesioginės išlaidos (Litais)			
					Darbas	Medžiagos	Mecha- nizmai	Iš viso
1	2	3	4	5	6	7	8	9
S9-Specifiniai darbai								54.96
S10-Sezoniniai darbai								1303.16
1	C1-910	Smėlis statybinis	m3	3310		99697.20		99697.20
2	T1-50	2 grupės grunto transportavimas 6t a/savivarčiais 1 km atstumu pakraunant 0,5m3 kaušo talpos	100m3	33.1			10275.56	10275.56
3	T1-60 (K4=34)	Transportuojant 1-2 grupės gruntą gerais keliais 6t a/savivarčiais už kiekvieną papildomą kilometrą pridėti	100m3	33.1			61363.56	61363.56
4	N1-83 (S10=1.15)	Darbai sąvartoje, atvežant autosavivarčiais II - III grupės gruntą	1000 m3	3.31	88.94	6.78	571.97	667.69
5	N1-371	Iki 30cm storio grunto sluoksnio sutankinimas nelaistant vandeniu, pereinant vibraciniu volu vieną kartą	100 m3	33.1			2655.28	2655.28
6	N1-372 (K4=7)	Kiekvienam sekančiam perėjimui vibraciniu volu sutankinant iki 30cm storio grunto sluoksnį pridėti prie N1-	100 m3	33.1			3461.60	3461.60
7	N27-19 (S10=1.15)	Pagrindų išlyginamųjų ir paruošiamųjų sluoksnių iš smėlio įrengimas	100 m3	3.94	503.12	13101.29	1008.17	14612.58
8	N27-43 (S10=1.15)	Vien sluoksnių 12 cm storio pagrindų ir dangų iš smėlio-žvyro mišinių įrengimas	100 m2	19.7	647.69	8893.13	1519.19	11060.01
9	N27-46 (K4=6)	Keičiant sluoksnio storį, kiekvienam sekančiam centimetrui prie normatyvų N27-43, N27-44, N27-45 pridėti arba atimti	100 m2	19.7		4414.63		4414.63
10	N22-75 (S9=1.034 S10=1.15)	Vamzdynai iš d600mm plieninių vamzdžių, su hidrauliniu išbandymu	m	51	699.61	288.71	1142.35	2130.67
11	N22-79 (S9=1.034 S10=1.15)	Vamzdynai iš d1000mm plieninių vamzdžių, su hidrauliniu išbandymu	m	11	250.14	119.76	363.26	733.16

1	2	3	4	5	6	7	8	9
12	C113-236	Plieniniai elektra suvirinti spiraline siūle b ir d grupės vamzdžiai su briaunele (gost 10704-76), išor. diam.=630mm, sienel. stor. 8 mm	m	51		20814.81		20814.81
13	C113-269	Plieniniai elektra suvirinti spiraline siūle b ir d grupės vamzdžiai su briaunele (gost 10704-76), išor. diam.=1020mm, sienel. stor.	m	11		9015.14		9015.14
14	N22-75 (K1=0.5 K2=0.5 K3=0 S9=1.034 S10=1.15)	Vamzdynai iš d600mm plieninių vamzdžių, su hidrauliniu išbandymu	m	51	349.81		571.18	920.99
15	N22-79 (K1=0.5 K2=0.5 K3=0 S9=1.034 S10=1.15)	Vamzdynai iš d1000mm plieninių vamzdžių, su hidrauliniu išbandymu	m	11	125.07		181.63	306.70
16	N27-19 (S10=1.15)	Pagrindų išlyginamųjų ir paruošiamųjų sluoksnių iš smėlio įrengimas	100 m <sup>3</sup>	6.4	817.25	21281.28	1637.63	23736.16
17	N47-12	Gruntinių profiliuotų 7,5m pločio kelių įrengimas III gr.	km	3.21			6146.19	6146.19
18	N47-18 (K4=8)	Keičiant kelio plotį kiekvienam metrui, pridėti arba atimti normatyvui N47-12	km	-3.21			-2596.26	-2596.26
19	N47-21	Profiluoto, 7,5m pločio, 150mm storio kelio dangos įrengimas iš žvyro	km	3.21	2100.27	158132.30	10111.83	170344.40
20	N47-25 (K4=8)	Keičiant kelio plotį kiekvienam 0,5m (kai dangos storis 150mm), pridėti arba atimti normatyvui N47-21	km	-3.21	-1120.15	-84335.17	-4951.10	-90406.42
21	N1-94	I grupės grunto kasimas ir perstūmimas iki 10m atstumu 55 kW (75AJ) galingumo buldožeriais	1000 m <sup>3</sup>	7.019			3298.23	3298.23
22	N1-95	Kiekvieniems sekantiems 10m, perstumiant I grupės gruntą 55kW (75AJ) galingumo buldožeriais pridėti prie N1-94	1000 m <sup>3</sup>	7.019			3038.53	3038.53
23	N1-74 (S10=1.15)	I grupės grunto kasimas 0,25m <sup>3</sup> kaušo talpos ekskavatoriais, pakraunant į autosavivarčius	1000 m <sup>3</sup>	7.019	986.93		14053.73	15040.66

1	2	3	4	5	6	7	8	9
24	T1-54	2 grupės grunto transportavimas 6t a/savivarčiais 1 km atstumu pakraunant 0,4m3 kaušo talpos	100m3	70.19			26538.84	26538.84
25	T1-60 (K4=4)	Transportuojant 1-2 grupės gruntą gerais keliais 6t a/savivarčiais už kiekvieną papildomą kilometrą pridėti	100m3	70.19			15308.72	15308.72
26	N1-83 (S10=1.15)	Darbai sąvartoje, atvežant autosavivarčiais II - III grupės gruntą	1000 m3	7.019	188.60	14.38	1212.88	1415.86
27	N27-25 (S10=1.15)	Pagrindų iš žvyro profilio taisymas pridėdant naujų medžiagų	100 m2	156	3907.74	31573.15	12550.20	48031.09
Iš viso #1					9545.02	283017.39	169463.17	462 026 L1
Pagalbinių medžiagų vertė						5.0%		14 151 L1
Papildomų mechanizmų vertė							5.0%	8 473 L1
Linijinio personalo uždarbis					17.3%			1 651 L1
Iš viso #2					11196.31	297168.26	177936.33	486 301 L1
Indeksas					1.00	1.00	1.00	
Po indeksacijos iš viso					11196.31	297168.26	177936.33	486 301 L1
Pridėtinės išlaidos					70.0%			6 682 L1
Soc. draudimas					30.0%			3 359 L1
Kitos išlaidos					3.0%	3.0%	3.0%	14 589 L1
Pelnas					10.0%	10.0%	10.0%	51 093 L1
Iš viso #3								562 023 L1
PVM					18%			101 164 L1
Iš viso #4								663 188 L1

Sudarė:

S.Posaškov



## **11. Financial Analysis Calculation**

## BIRZAI (Option 1: Loan Interest = 5%)

Category	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	3313	3314	3315	3316	3317	3318	3319	3320	3321	3322	3323	3324	3325	3326	3327	3328	3329	3330	3331	3332	3333	3334	3335	3336	3337	3338	3339	3340	3341	3342	3343	3344	3345	3346	3347	3348	3349	3350	3351	3352	3353	3354	3355	3356	3357	3358	3359	3360	3361	3362	3363	3364	3365
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11-1

BIRZAI (Option 1: Loan Interest = 6%)																
	Project Year															
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (2012)	1.997	2.007	2.012	2.017	2.022	2.027	2.032	2.037	2.042	2.047	2.052	2.057	2.062	2.067	2.072	2.077
Inflation rate (2027)	2.119	2.225	2.336	2.453	2.575	2.704	2.839	2.981	3.130	3.287	3.451	3.624	3.805	3.995	4.195	4.405
Operating Income																
Land	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42
Domestic	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42	2,42
Industrial	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303	1,861,303
Domestic	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877	440,877
Industrial	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260	2,302,260
Operating Income	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00	1,00
Cost of energy usage																
STP	387,809	407,199	427,559	448,037	471,304	494,953	519,701	545,686	572,970	601,618	631,699	663,284	696,449	731,271		
PS	213,469	224,142	235,349	247,117	259,473	272,446	286,069	299,372	313,391	328,160	343,718	359,104	365,104	383,359	402,527	
Cost of chemical	174,040	180,057	186,313	192,810	199,547	206,524	213,751	221,228	228,955	236,932	245,169	253,666	262,424	271,444	280,724	
Wages, Social Securities	141,780	148,869	156,313	164,128	172,338	180,961	189,999	199,469	209,474	219,047	229,290	239,213	248,924	258,437	267,747	
Salaries (P)	177,435	186,307	195,622	205,403	215,673	226,457	237,760	249,609	262,152	275,260	289,023	303,474	318,647	334,560		
Salaries	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	
Social Insurance	136,408	143,313	150,478	158,002	165,902	174,197	182,907	192,053	201,655	211,738	222,325	233,441	245,113	257,369		
Parts, Maintenance	183,350	192,516	202,144	212,251	222,864	234,007	245,707	257,993	270,892	284,437	298,659	313,591	329,271	345,735		
STP	167,740	176,127	184,933	194,180	203,889	214,083	224,787	235,027	245,828	256,239	267,279	278,062	288,602	299,004	309,277	
PS	15,611	16,391	17,211	18,071	18,975	19,924	20,920	21,965	23,060	24,217	25,428	26,700	28,034	29,436	30,909	
Fuel	11,657	12,240	12,852	13,495	14,176	14,898	15,622	16,403	17,233	18,114	19,046	19,930	20,868	21,862	22,912	
Analysis cost	38,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	
Analysis cost (P)	82,861	87,004	91,355	95,922	100,754	105,754	111,042	116,594	122,424	128,545	134,972	141,721	148,807	156,247		
Others outsourcing Service (P)	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	
Others outsourcing Service	18,733	19,668	20,653	21,686	22,770	23,908	25,104	26,359	27,677	29,051	30,484	32,009	33,641	35,383		
W & S for Administration	598,587	626,417	657,788	690,624	726,156	764,413	804,484	846,358	891,041	937,563	985,932	1,036,160	1,089,260	1,145,240		
Salaries (P)	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	
Salaries	450,913	481,859	505,952	531,250	558,812	588,603	619,648	653,937	691,484	732,304	776,413	823,721	874,328	928,243		
Social Insurance	174,552	182,652	191,786	201,937	213,144	225,413	238,751	253,169	268,678	285,287	303,007	321,838	341,781	362,936		
Depreciation	98,044	102,946	108,946	115,946	123,946	132,946	142,946	153,946	165,946	178,946	192,946	207,946	223,946	240,946		
Taxes	83,117	87,273	91,624	96,174	101,924	107,874	114,024	120,474	127,224	134,274	141,624	149,274	157,224	165,574		
Nature Protection Tax	9,261	9,724	10,194	10,674	11,164	11,674	12,194	12,724	13,264	13,814	14,374	14,944	15,524	16,114		
Property tax	5,665	5,949	6,246	6,546	6,846	7,146	7,446	7,746	8,046	8,346	8,646	8,946	9,246	9,546		
Road Tax	84,748	88,986	93,435	98,103	103,012	108,168	113,571	119,220	125,212	131,473	138,046	144,949	152,196	159,806		
Other GVA	1,16	1,22	1,28	1,34	1,40	1,46	1,52	1,58	1,64	1,70	1,76	1,82	1,88	1,94		
Pollution Charge (P)	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	
Pollution Charge	22,308	23,508	24,808	26,108	27,408	28,708	30,008	31,308	32,608	33,908	35,208	36,508	37,808	39,108		
Preparing for Bad Recoverables	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	55,841	
Operating Cost	2,035,787	2,114,156	2,208,201	2,302,260	2,402,260	2,502,260	2,602,260	2,702,260	2,802,260	2,902,260	3,002,260	3,102,260	3,202,260	3,302,260	3,402,260	
Operating Profit	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	268,473	
Interest Payment	368,553	200,912	214,468	225,243	236,138	247,151	258,284	269,537	280,910	292,403	304,016	315,749	327,602	339,675		
E.A.I.B.T	-40,080	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	-102,808	
Accumulate Profit (loss)	-4,460,555	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	-8,563,363	
Corporate Profit Tax	134,472	59,844	212,449	136,610	51,067	214,781	127,220	28,842	203,922	102,559	-10,843	176,403	59,063	27,464		
Cash Flow	287,783	287,783	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	
Changing in Working Cap.	312,631	328,473	344,697	362,141	380,248	399,261	419,224	440,195	462,194	485,204	509,269	535,048	561,900	590,990		
Principal Repayment	134,472	88,844	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	183,676	
Net Cash Flow																

FIRR = 5.00 %

RIRZAI Option 1: Loan Interest at 6%

Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Industrial	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Other	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Majority rate	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Inflation rate (GDP)	1.967	2.007	2.047	2.087	2.127	2.167	2.207	2.247	2.287	2.327	2.367	2.407	2.447
Inflation rate (GDP)	2.119	2.275	2.355	2.435	2.515	2.595	2.675	2.755	2.835	2.915	2.995	3.075	3.155
Domestic	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Industrial	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Other	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operating Income	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200	2,302,200
Cost of energy usage	347,405	407,199	437,559	469,937	471,394	456,953	519,701	545,996	572,070	601,614	631,694	662,264	693,334
STP	213,409	224,142	235,349	247,117	249,479	227,007	259,050	283,314	303,372	319,391	331,160	347,718	365,124
PS	174,340	193,057	192,210	201,820	211,911	195,956	229,652	245,514	257,699	270,579	284,561	299,850	316,204
Cost of chemical	141,780	149,869	156,313	164,128	172,335	180,947	189,964	199,389	209,224	219,467	230,115	241,171	252,638
Wages, Social Securities	177,435	195,307	195,632	205,403	215,673	226,457	237,763	249,599	261,952	274,820	288,123	301,869	316,061
Salaries (P)	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350
Salaries	136,488	143,313	143,313	143,313	143,313	143,313	143,313	143,313	143,313	143,313	143,313	143,313	143,313
Social Insurance	40,546	42,994	42,994	42,994	42,994	42,994	42,994	42,994	42,994	42,994	42,994	42,994	42,994
Parts Maintenance	143,350	152,518	162,144	172,261	182,864	193,983	205,727	218,097	231,097	244,732	259,001	273,914	289,481
STP	167,740	178,127	189,127	199,740	209,989	220,764	232,164	244,197	256,862	270,157	284,092	298,668	313,885
PS	15,811	16,351	16,351	16,351	16,351	16,351	16,351	16,351	16,351	16,351	16,351	16,351	16,351
Fuel	11,657	12,240	12,852	13,495	14,170	14,878	15,622	16,403	17,220	18,073	18,962	19,886	20,845
Analysis cost (P)	35,109	30,109	34,109	38,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109
Analysis cost (P)	82,961	87,004	91,055	95,022	100,716	105,754	111,042	116,584	122,424	128,545	134,972	141,731	148,781
Others outsourcing Service (P)	16,733	19,665	20,653	21,686	22,770	23,908	25,104	26,359	27,677	29,061	30,514	32,039	33,637
Others outsourcing Service	566,587	626,417	657,738	690,624	725,156	761,413	799,484	839,458	881,431	925,503	971,778	1,020,367	1,071,374
W & S for Administration	213,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries (P)	458,913	461,858	461,858	461,858	461,858	461,858	461,858	461,858	461,858	461,858	461,858	461,858	461,858
Salaries	137,674	144,558	151,785	159,375	167,344	175,711	184,496	193,721	203,407	213,578	224,256	235,469	247,141
Social Insurance	174,552	182,652	192,652	202,652	212,652	222,652	232,652	242,652	252,652	262,652	272,652	282,652	292,652
Depreciation	98,044	102,946	107,946	112,946	117,946	122,946	127,946	132,946	137,946	142,946	147,946	152,946	157,946
Taxes	83,117	87,273	91,537	95,907	100,382	104,962	109,646	114,434	119,326	124,322	129,424	134,632	139,946
Nature Protection Tax	9,251	9,724	10,210	10,708	11,218	11,740	12,274	12,820	13,378	13,948	14,530	15,124	15,730
Property tax	5,955	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949
Road Tax	84,749	88,996	93,435	98,107	103,012	108,163	113,571	119,239	125,212	131,473	138,046	144,949	152,193
Other GVA	1,16	1,22	1,22	1,22	1,22	1,28	1,28	1,34	1,34	1,34	1,34	1,34	1,34
Pollution Charge (P)	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340
Pollution Charge	22,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308	23,308
Preparing for Bad Receivables	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941	55,941
Operating Cost	2,035,787	2,114,156	2,208,201	2,301,085	2,404,615	2,518,673	2,643,950	2,780,545	2,928,467	3,086,847	3,256,130	3,436,744	3,628,173
Operating Profit	266,413	188,044	93,999	30,115	197,585	783,227	1,558,250	2,419,655	3,373,733	4,415,353	5,545,370	6,765,460	8,074,027
Interest Payment	306,553	260,912	214,468	167,243	124,136	80,254	35,701	4,400	4,400	4,400	4,400	4,400	4,400
EATBT	-40,000	-102,868	-120,469	-136,928	-150,551	-160,419	-166,749	-169,945	-171,047	-171,047	-171,047	-171,047	-171,047
Accumulate Profit (loss)	-8,450,555	-8,553,467	-8,656,992	-8,761,135	-8,866,902	-8,973,314	-9,080,382	-9,188,114	-9,296,520	-9,405,610	-9,515,384	-9,625,842	-9,736,984
Corporate Profit Tax	-40,000	-102,868	-120,469	-136,928	-150,551	-160,419	-166,749	-169,945	-171,047	-171,047	-171,047	-171,047	-171,047
Net Profit	134,472	55,844	212,449	136,910	51,007	214,781	127,220	29,642	203,922	402,559	598,923	792,416	982,981
Cash Flow	0	0	28,778	0	31,656	0	34,812	0	38,352	0	42,280	0	46,596
Changing in Working Cap	287,783	287,783	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561	316,561
Principal Repayment	312,831	328,473	344,897	362,141	380,248	399,261	419,224	440,185	462,194	485,204	509,269	534,336	560,451
Net Cash Flow	134,472	55,844	188,044	103,967	167,610	51,007	303,125	107,220	208,642	369,101	588,599	869,953	1,212,527

11.1K = 5.00 %

Option1.7a

BIRZAI (Option 1: Loan Interest = 7%)									
	1,254	1,339	1,423	1,508	1,593	1,678	1,763	1,848	1,933
Domestic	1,254	1,339	1,423	1,508	1,593	1,678	1,763	1,848	1,933
Industrial	500	500	500	500	500	500	500	500	500
Total	1,829	1,705	1,781	1,839	1,958	2,013	2,092	2,138	2,200
Inflation rate	0.081	0.059	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (98P)	1.000	1.059	1.112	1.168	1.226	1.287	1.352	1.419	1.481
Inflation rate (97P)	1.081	1.124	1.180	1.239	1.301	1.366	1.434	1.504	1.574
Tariff	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Domestic	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Industrial	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74
Total	3.48	3.48	3.48	3.48	3.48	3.48	3.48	3.48	3.48
Operating Cost	202,920	219,852	233,449	247,865	263,033	278,000	292,800	307,488	322,080
Cost of energy usage	124,811	135,220	141,845	148,805	156,048	163,544	171,280	179,256	187,472
Cost of chemical	78,118	84,633	91,604	99,060	106,987	115,398	124,302	133,708	143,616
Wages, Social Securities	82,896	89,809	94,210	98,832	103,641	108,641	113,841	119,241	124,841
Salaries (p)	103,742	108,930	114,376	120,000	125,816	131,832	138,048	144,464	151,080
Salaries	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350
Social Insurance	79,802	83,792	87,992	92,392	97,000	101,800	106,800	112,000	117,400
Parts, Maintenance	23,941	25,138	26,394	27,714	29,100	30,555	32,080	33,675	35,340
STP	105,089	113,831	122,682	131,648	140,728	150,000	159,472	169,144	179,016
PS	98,074	106,253	114,600	123,116	131,800	140,656	149,680	158,872	168,232
Analysis cost (P)	6,995	7,378	7,764	8,152	8,544	8,940	9,340	9,744	10,152
Others outsourcing Service (p)	5,838	6,179	6,524	6,872	7,224	7,580	7,940	8,304	8,672
W & S for Administration	29,972	30,925	31,879	32,832	33,784	34,736	35,688	36,640	37,592
Salaries (P)	37,128	40,225	43,328	46,432	49,536	52,640	55,744	58,848	61,952
Salaries	6,776	6,991	7,207	7,422	7,638	7,854	8,070	8,286	8,502
Social Insurance	8,394	8,994	9,594	10,194	10,794	11,394	11,994	12,594	13,194
Depreciation	348,812	366,253	384,694	403,135	421,576	440,017	458,458	476,899	495,340
Taxes	268,317	281,733	295,820	310,611	326,141	342,448	359,571	377,540	396,400
Nature Protection Tax	80,405	84,520	88,746	93,183	97,842	102,734	107,871	113,265	118,918
Property Tax	825,474	855,474	885,474	915,474	945,474	975,474	1,005,474	1,035,474	1,065,474
Road Tax	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694
Other G/A	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pullition Charge (p)	14,822	15,293	15,764	16,236	16,708	17,180	17,652	18,124	18,596
Pullition Charge	14,822	15,293	15,764	16,236	16,708	17,180	17,652	18,124	18,596
Preparing for Bad Receivables	37,812	29,538	33,852	35,212	40,206	43,586	47,971	52,356	56,741
Operating Cost	1,907,160	1,962,405	2,021,804	2,086,259	2,155,194	2,228,630	2,306,403	2,388,576	2,475,100
Interest Payment	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000	450,000
E.A.I.B.T	-1,096,788	-1,110,823	-994,729	-1,013,853	-878,447	-690,882	-510,175	-340,319	-189,579
Accumulate Profit (loss)	-1,096,788	-2,207,611	-3,202,340	-4,216,193	-5,094,640	-5,963,522	-6,898,175	-7,840,339	-8,889,447
Corporate Profit Tax	0	0	0	0	0	0	0	0	0
Net Profit	-1,096,788	-1,110,823	-994,729	-1,013,853	-878,447	-690,882	-510,175	-340,319	-189,579
Cash Flow	-271,314	-285,349	-169,255	-188,379	-52,973	-65,408	-83,179	-105,749	-133,849
Changing in Working Cap.	157,550	5,151	21,937	5,665	25,168	7,000	7,985	7,700	27,542
Principal Repayment	0	0	0	0	0	0	0	0	0
Net Cash Flow	157,550	162,702	194,638	190,305	215,472	222,472	229,473	236,120	242,762
IRR = 5.08 %									

BIRZAI (Option 1: Loan Interest = 7%)	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Domestic</b>	500	500	500	500	500	500	500	500	500	500	500	500	500	500
<b>Industrial</b>	500	500	500	500	500	500	500	500	500	500	500	500	500	500
<b>Total</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Inflation rate</b>	0.061	0.069	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070	0.070
<b>Inflation rate (GRP)</b>	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
<b>Inflation rate (GDP)</b>	1.061	1.069	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070	1.070
<b>Operating Income</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Operating Cost:</b>														
Cost of energy usage	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811	124,811
Cost of Chemical	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118	76,118
Wages Social Securities	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896	82,896
Salaries (p)	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900	105,900
Salaries	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802	79,802
Social Insurance	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941	23,941
Parts Maintenance	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069	105,069
STP	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074	96,074
PS	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995	6,995
Analysis cost (p)	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972	20,972
Others outsourcing Service	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776	6,776
W & S for Administration	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394	8,394
Salaries (p)	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253	36,253
Salaries	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Social Insurance	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495	30,495
Social Insurance	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474	825,474
Depreciation	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604	84,604
Taxes	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800
Nature Protection Tax	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Property Tax	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894
Road Tax	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551	40,551
Other CIA	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pollution Charge (p)	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822
Pollution Charge	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822	14,822
Preparing for Bad Receivables	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812	37,812
Operating Cost:	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160	1,907,160
<b>Operating Profit</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Interest Payment</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Accumulate Profit (Loss)</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Corporate Profit Tax</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Net Profit</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Cash Flow</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Changing in Working Cap</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Principal Repayment</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
<b>Net Cash Flow</b>	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

Option1.7%

BIRZAI (Option 1: Loan Interest = 7%)	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (98P)	1.997	2.097	2.202	2.312	2.427	2.549	2.676	2.810	2.958	3.120	3.297	3.485	3.686	3.900
Inflation rate (97P)	2.119	2.225	2.336	2.453	2.575	2.704	2.839	2.981	3.130	3.287	3.451	3.624	3.805	3.995
Tariff	2.154	2.254	2.360	2.472	2.590	2.714	2.844	2.980	3.122	3.270	3.424	3.584	3.750	3.922
Domestic	2,154	2,254	2,360	2,472	2,590	2,714	2,844	2,980	3,122	3,270	3,424	3,584	3,750	3,922
Industrial	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Domestic	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529	1,959,529
Industrial	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123	464,123
Operating Income	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552	2,423,552
Operating Cost	387,809	407,199	427,559	448,937	471,384	494,953	519,701	545,686	572,970	601,618	631,699	663,284	696,449	731,271
Cost of energy usage	213,469	224,142	235,349	247,117	259,473	272,446	286,069	300,372	315,391	331,160	347,718	365,104	383,359	402,527
PS	174,340	183,057	192,210	201,820	211,911	222,507	233,632	245,314	257,579	270,458	283,981	298,180	313,089	328,744
Cost of chemical	141,780	148,869	156,313	164,128	172,335	180,951	189,999	199,499	209,474	219,947	230,945	242,492	254,617	267,347
Wages Social Securities	177,435	186,307	195,622	205,403	215,673	226,457	237,780	249,669	262,152	275,260	289,023	303,474	318,647	334,580
Salaries	68,350	71,435	74,580	77,795	81,080	84,445	87,890	91,415	95,020	98,705	102,470	106,315	110,240	114,245
Social Insurance	136,488	143,313	150,478	157,950	165,800	174,137	182,907	192,053	201,555	211,438	221,735	232,441	243,559	255,099
Parts, Maintenance	183,350	192,518	202,144	212,251	222,864	234,000	245,707	257,993	270,892	284,437	298,659	313,591	329,271	345,735
STP	167,740	176,127	184,933	193,664	202,339	211,000	219,657	228,320	236,987	245,658	254,333	263,012	271,695	280,382
PS	15,611	16,391	17,211	18,071	18,975	19,924	20,920	21,966	23,064	24,217	25,428	26,700	28,034	29,436
Fuel	11,657	12,240	12,852	13,495	14,170	14,878	15,622	16,403	17,223	18,084	18,989	19,938	20,935	21,982
Analysis cost	82,361	87,004	91,109	95,922	100,718	105,594	110,542	115,564	120,662	125,838	131,092	136,426	141,840	147,334
Others outsourcing Service	8,842	9,286	9,740	10,204	10,678	11,162	11,656	12,160	12,674	13,198	13,732	14,276	14,830	15,394
W & S for Administration	18,733	19,665	20,653	21,686	22,770	23,908	25,104	26,359	27,677	29,061	30,514	32,039	33,642	35,323
Salaries(P)	596,587	626,417	657,738	690,624	725,156	761,413	799,484	839,458	881,431	925,503	971,778	1,020,367	1,071,385	1,124,954
Salaries	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries	458,913	489,819	505,952	531,250	557,812	585,701	614,888	645,737	678,024	711,925	747,521	784,898	824,142	865,350
Social Insurance	137,674	144,568	151,786	159,375	167,344	175,711	184,496	193,721	203,407	213,576	224,256	235,469	247,243	259,605
Depreciation	174,552	182,652	191,062	199,862	209,062	218,662	228,662	239,062	249,862	261,062	272,662	284,662	297,062	310,062
Taxes	98,044	102,946	108,046	113,446	119,146	125,146	131,546	138,346	145,546	153,146	161,146	169,646	178,646	188,146
Nature Protection Tax	23,117	24,273	25,473	26,713	28,000	29,333	30,713	32,143	33,623	35,153	36,733	38,363	40,043	41,773
Property Tax	9,281	9,724	10,204	10,724	11,280	11,872	12,500	13,164	13,864	14,608	15,392	16,216	17,080	17,984
Road Tax	5,665	5,949	6,246	6,558	6,886	7,228	7,584	7,954	8,338	8,736	9,148	9,574	10,014	10,466
Other G/A	84,749	88,986	93,435	98,107	103,012	108,163	113,571	119,250	125,212	131,473	138,046	144,949	152,196	159,806
Pullution Charge(p)	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340
Pullution Charge	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388	21,388
Preparing for Bad Receivables	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786	58,786
Operating Cost	2,030,731	2,117,101	2,211,440	2,304,323	2,408,174	2,514,068	2,622,000	2,732,079	2,844,406	2,959,082	3,076,107	3,195,582	3,318,507	3,444,982
Operating Profit	392,821	306,451	212,112	119,229	35,178	-134,516	-288,051	-458,126	-643,854	-845,934	-1,064,409	-1,293,336	-1,532,811	-1,782,882
Interest Payment	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121	42,121
E.A.I.B.T	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201
Accumulate Profit(loss)	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648	-9,124,648
Corporate Profit Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Profit	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201	-47,201
Cash Flow	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351
Changing in Working Cap.	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957	302,957
Principal Repayment	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749	273,749
Net Cash Flow	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351	127,351

FIRR = 6.08%



Option 1.9%

BIRZAI (Option 1: Loan Interest = 9%)

Project Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Domestic															
Industrial															
Total															
Inflation rate															
Inflation rate(9%)															
Inflation rate(9%)															
Tariff															
Domestic															
Industrial															
Domestic															
Industrial															
Operating Income															
Cost of energy usage															
Cost of chemical															
Wages, Social Securities															
Salaries(p)															
Salaries															
Social Insurance															
Parts Maintenance															
STP															
PS															
Fuel															
Analysis cost															
Analysis cost(p)															
Others outsourcing Service															
W & S for Administration															
Salaries(p)															
Salaries															
Social Insurance															
Depreciation															
Taxes															
Other GVA															
Pollution Charge(p)															
Pollution Charge															
Preparing for Bad Receivables															
Operating Cost															
Operating Profit															
Interest Payment															
E.A.I.B T															
Accumulate Profit(loss)															
Corporate Profit Tax															
Net Profit															
Cash Flow															
Changing in Working Cap															
Principal Repayment															
Net Cash Flow															

FIRR = 5.11 %

**FIRR = 5.11%**

RIZAI (Option 1: Loan Interest = 9%)													
Project Year													
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611	2,611
Cost of energy usage	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Cost of chemical	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47	1,47
Wages Social Securities	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000
Salaries	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947	1,947
Social Insurance	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
parts Maintenance	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Fuel	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Analysis cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Others outsourcing Service	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
W & S for Administration	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Salaries(P)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Salaries	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Social Insurance	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Depreciation	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Taxes	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Other GIA	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pullution Charge(P)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Pullution Charge	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Preparing for Bad Receivables	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operating Cost	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Operating Profit	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Interest Payment	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
E A I B T	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Accumulate Profit(loss)	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Corporate Profit Tax	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Net Profit	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Cash Flow	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Changing in Working Cap	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Principal Repayment	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Net Cash Flow	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000

PKR 1.117

Option 2.5%

BIRZAI (Option 2: Loan Interest = 5%)		Project Year															
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Domestic			1,254	1,339	1,423	1,488	1,553	1,618	1,683	1,747	1,820	1,893	1,966	2,038	2,111	2,111	
Industrial			500	500	500	500	500	500	500	500	500	500	500	500	500	500	
Total		1,879	1,629	1,705	1,781	1,839	1,898	1,956	2,013	2,072	2,138	2,204	2,269	2,340	2,400	2,400	
Inflation rate			1.09	1.13	1.09	1.17	1.20	1.24	1.27	1.31	1.35	1.39	1.43	1.47	1.47	1.47	
Inflation rate (GDP)		1.000	0.061	0.059	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
Inflation rate (GDP)			1.000	1.059	1.112	1.168	1.226	1.287	1.352	1.419	1.490	1.565	1.643	1.725	1.811	1.902	
Inflation rate (GDP)			1.061	1.124	1.180	1.239	1.301	1.366	1.434	1.506	1.581	1.660	1.743	1.830	1.922	2.018	
Tariff																	
Domestic			1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	1,755	
Industrial			500	500	500	500	500	500	500	500	500	500	500	500	500	500	
Total		320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	320,286	
Operating Income		1,273,463	1,315,100	1,402,412	1,492,412	1,538,213	1,641,640	1,741,640	1,798,222	1,854,804	1,912,386	1,970,968	2,030,550	2,091,132	2,152,714	2,215,296	
Cost of energy usage																	
STP																	
PS																	
Cost of chemical																	
Weight Social Securities																	
Salaries (p)																	
Salaries																	
Social Insurance																	
Parts Maintenance																	
STP																	
PS																	
Fuel																	
Analysis cost																	
Others outsourcing Service																	
W & S for Administration																	
Salaries (P)																	
Salaries																	
Social Insurance																	
Depreciation																	
Taxes																	
Nature Protection Tax																	
Property tax																	
Road Tax																	
Other G/A																	
Pullution Charge (p)																	
Pullution Charge																	
Preparing for Bad Receivables																	
Operating Cost																	
Operating Profit																	
Interest Payment																	
E.A.I.B.T																	
Accumulate Profit (loss)																	
Corporate Profit Tax																	
Net Profit																	
Cash Flow																	
Changing in Working Cap																	
Principal Repayment																	
Net Cash Flow																	

FIRR = 5.02 %

FIRR = 5.02 %



Option 2.5%

BIRZAI (Option 2: Loan Interest = 5%)

Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (6P)	1.967	2.067	2.202	2.312	2.427	2.549	2.678	2.810	2.950	3.098	3.253	3.415	3.586	3.765
Inflation rate (8P)	2.119	2.225	2.336	2.453	2.575	2.704	2.839	2.981	3.130	3.287	3.451	3.624	3.805	3.995
Interest	2.57	2.57	2.57	2.53	2.43	2.28	2.11	1.90	1.65	1.37	1.07	0.76	0.45	0.14
Domestic	2.57	2.57	2.57	2.53	2.43	2.28	2.11	1.90	1.65	1.37	1.07	0.76	0.45	0.14
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
Operating income	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768	2,448,768
Cost of energy usage	307,809	407,109	427,550	448,937	471,384	494,953	519,701	545,696	572,970	601,618	631,699	663,284	696,449	731,271
STP	213,468	224,142	235,340	247,117	259,474	272,446	286,059	300,372	315,391	331,160	347,718	365,104	383,359	402,527
PS	174,340	183,057	192,210	200,920	209,120	217,818	226,000	234,660	242,800	251,418	260,500	269,050	278,060	287,530
Cost of chemical	141,780	146,869	152,313	158,128	164,313	170,869	177,796	185,096	192,771	200,821	209,246	218,046	227,221	236,771
Wages, Social Securities	177,435	186,307	195,622	205,403	215,653	226,383	237,603	249,323	261,543	274,263	287,483	301,203	315,423	330,143
Salaries (p)	68,350	71,435	74,520	77,605	80,690	83,775	86,860	89,945	93,030	96,115	99,200	102,285	105,370	108,455
Salaries	136,485	142,313	148,140	153,967	159,794	165,621	171,448	177,275	183,102	188,929	194,756	200,583	206,410	212,237
Social Insurance	40,948	42,984	45,143	47,401	49,771	52,259	54,767	57,296	59,845	62,414	64,993	67,582	70,181	72,790
Parts, Maintenance	163,350	169,128	175,127	181,353	187,828	194,553	201,528	208,753	216,228	223,953	231,928	240,153	248,628	257,353
STP	107,740	112,340	117,120	122,080	127,220	132,540	138,050	143,750	149,550	155,450	161,450	167,550	173,750	180,050
PS	15,611	16,391	17,211	18,071	18,971	19,911	20,891	21,911	22,971	24,071	25,211	26,391	27,611	28,871
Fuel	11,637	12,340	13,080	13,850	14,660	15,510	16,400	17,330	18,300	19,310	20,360	21,450	22,580	23,750
Analysis cost (P)	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109
Analysis cost	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842
Others outsourcing Service (p)	19,733	19,669	20,653	21,686	22,770	23,908	25,104	26,359	27,677	29,051	30,481	31,967	33,509	35,107
Others outsourcing Service	595,587	626,417	657,738	689,624	722,158	755,346	789,184	823,672	858,810	894,600	931,042	968,146	1,005,914	1,044,346
W & S for Administration	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries (P)	458,913	481,859	505,952	531,250	557,812	585,603	614,648	645,053	676,824	710,000	744,600	780,640	818,140	857,140
Salaries	137,674	144,558	151,786	159,375	167,344	175,711	184,486	193,671	203,267	213,273	223,693	234,433	245,493	256,873
Social Insurance	319,854	337,303	354,166	371,475	389,269	407,561	426,362	445,681	465,517	485,870	506,743	528,146	549,089	570,573
Depreciation	90,044	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946
Taxes	83,117	87,273	91,537	95,910	100,393	105,083	109,883	114,793	119,813	124,943	130,183	135,533	140,993	146,563
Nature Protection Tax	9,201	9,724	10,270	10,839	11,431	12,046	12,683	13,343	14,026	14,731	15,458	16,206	16,976	17,768
Property tax	5,665	5,949	6,246	6,556	6,879	7,214	7,561	7,920	8,291	8,674	9,069	9,476	9,895	10,326
Road Tax	84,740	88,866	93,435	98,507	103,012	108,163	113,951	119,250	125,212	131,473	138,046	144,949	152,196	159,806
Other G/A	1.16	1.22	1.22	1.22	1.28	1.28	1.34	1.34	1.34	1.34	1.41	1.41	1.41	1.48
Pullution Charge (p)	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340	10,340
Pullution Charge	22,368	23,508	24,683	25,893	27,138	28,418	29,733	31,083	32,468	33,888	35,343	36,833	38,358	39,918
Preparation for Bad Receivables	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395	59,395
Operating Cost	2,104,642	2,263,012	2,357,412	2,450,285	2,554,146	2,663,003	2,777,858	2,897,713	3,023,568	3,155,423	3,293,278	3,437,133	3,586,988	3,742,843
Operating Profit	344,126	185,756	191,356	198,833	204,423	210,815	218,010	226,075	235,000	244,800	255,470	266,990	279,350	292,550
Interest Payment	460,178	435,669	412,045	386,158	358,978	330,456	300,689	269,683	237,434	203,964	169,283	133,402	96,321	58,940
E.A. (B.T)	-106,054	-250,943	-75,812	-142,868	-219,478	-301,510	-398,057	-508,141	-632,787	-773,024	-928,953	-1,105,583	-1,303,013	-1,520,243
Accumulate Profit (loss)	-11,458,258	-11,706,201	-11,965,012	-12,235,281	-12,517,010	-12,801,200	-13,087,951	-13,377,364	-13,670,439	-13,967,174	-14,267,569	-14,571,624	-14,879,739	-15,191,914
Corporate Profit Tax	-106,054	-250,943	-75,812	-142,868	-219,478	-301,510	-398,057	-508,141	-632,787	-773,024	-928,953	-1,105,583	-1,303,013	-1,520,243
Net Profit	123,800	57,011	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610
Cash Flow	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096	300,096
Changing in Working Cap.	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603	499,603
Principal Repayment	123,600	57,011	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610	30,610
Net Cash Flow	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095	774,095

FIRR = 5.02 %



Option 2.7%

BIRZAI (Option 2: Loan Interest = 7%)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408	2409	2410	2411	2412	2413	2414	2415	2416	2417	2418	2419	2420	2421	2422	2423	2424	2425	2426	2427	2428	2429	2430	2431	2432	2433	2434	2435	2436	2437	2438	2439	2440	2441	2442	2443	2444	2445	2446	2447	2448	2449	2450	2451	2452	2453	2454	2455	2456	2457	2458	2459	2460	2461	2462	2463	2464	2465	2466	2467	2468	2469	2470	2471	2472	2473	2474	2475	2476	2477	2478	2479	2480	2481	2482	2483	2484	2485	2486	2487	2488	2489	2490	2491	2492	2493	2494	2495	2496	2497	2498	2499	2500	2501	2502	2503	2504	2505	2506	2507	2508	2509	2510	2511	2512	2513	2514	2515	2516	2517	2518	2519	2520	2521	2522	2523	2524	2525	2526	2527	2528	2529	2530	2531	2532	2533	2534	2535	2536	2537	2538	2539	2540	2541	2542	2543	2544	2545	2546	2547	2548	2549	2550	2551	2552	2553	2554	2555	2556	2557	2558	2559	2560	2561	2562	2563	2564	2565	2566	2567	2568	2569	2570	2571	2572	2573	2574	2575	2576	2577	2578	2579	2580	2581	2582	2583	2584	2585	2586	2587	2588	2589	2590	2591	2592	2593	2594	2595	2596	2597	2598	2599	2600	2601	2602	2603	2604	2605	2606	2607	2608	2609	2610	2611	2612	2613	2614	2615	2616	2617	2618	2619	2620	2621	2622	2623	2624	2625	2626	2627	2628	2629	2630	2631	2632	2633	2634	2635	2636	2637	2638	2639	2640	2641	2642	2643	2644	2645	2646	2647	2648	2649	2650	2651	2652	2653	2654	2655	2656	2657	2658	2659	2660	2661	2662	2663	2664	2665	2666	2667	2668	2669	2670	2671	2672	2673	2674	2675	2676	2677	2678	2679	2680	2681	2682	2683	2684	2685	2686	2687	2688	2689	2690	2691	2692	2693	2694	2695	2696	2697	2698	2699	2700	2701	2702	2703	2704	2705	2706	2707	2708	2709	2710	2711	2712	2713	2714	2715	2716	2717	2718	2719	2720	2721	2722	2723	2724	2725	2726	2727	2728	2729	2730	2731	2732	2733	2734	2735	2736	2737	2738	2739	2740	2741	2742	2743	2744	2745	2746	2747	2748	2749	2750	2751	2752	2753	2754	2755	2756	2757	2758	2759	2760	2761	2762	2763	2764	2765	2766	2767	2768	2769	2770	2771	2772	2773	2774	2775	2776	2777	2778	2779	2780	2781	2782	2783	2784	2785	2786	2787	2788	2789	2790	2791	2792	2793	2794	2795	2796	2797	2798	2799	2800	2801	2802	2803	2804	2805	2806	2807	2808	2809	2810	2811	2812	2813	2814	2815	2816	2817	2818	2819	2820	2821	2822	2823	2824	2825	2826	2827	2828	2829	2830	2831	2832	2833	2834	2835	2836	2837	2838	2839	2840	2841	2842	2843	2844	2845	2846	2847	2848	2849	2850	2851	2852	2853	2854	2855	2856	2857	2858	2859	2860	2861	2862	2863	2864	2865	2866	2867	2868	2869	2870	2871	2872	2873	2874	2875	2876	2877	2878	2879	2880	2881	2882	2883	2884	2885	2886	2887	2888	2889	2890	2891	2892	2893	2894	2895	2896	2897	2898	2899	2900	2901	2902	2903	2904	2905	2906	2907	2908	2909	2910	2911	2912	2913	2914	2915	2916	2917	2918	2919	2920	2921	2922	2923	2924	2925	2926	2927	2928	2929	2930	2931	2932	2933	2934	2935	2936	2937	2938	2939	2940	2941	2942	2943	2944	2945	2946	2947	2948	2949	2950	2951	2952	2953	2954	2955	2956	2957	2958	2959	2960	2961	2962	2963	2964	2965	2966	2967	2968	2969	2970	2971	2972	2973	2974	2975	2976	2977	2978	2979	2980	2981	2982	2983	2984	2985	2986	2987	2988	2989	2990	2991	2992	2993	2994	2995	2996	2997	2998	2999	3000	3001	3002	3003	3004	3005	3006	3007	3008	3009	3010	3011	3012	3013	3014	3015	3016	3017	3018	3019	3020	3021	3022	3023	3024	3025	3026	3027	3028	3029	3030	3031	3032	3033	3034	3035	3036	3037	3038	3039	3040	3041	3042	3043	3044	3045	3046	3047	3048	3049	3050	3051	3052	3053	3054	3055	3056	3057	3058	3059	3060	3061	3062	3063	3064	3065	3066	3067	3068	3069	3070	3071	3072	3073	3074	3075	3076	3077	3078	3079	3080	3081	3082	3083	3084	3085	3086	3087	3088	3089	3090	3091	3092	3093	3094	3095	3096	3097	3098	3099	3100	3101	3102	3103	3104	3105	3106	3107	3108	3109	3110	3111	3112	3113	3114	3115	3116	3117	3118	3119	3120	3121	3122	3123	3124	3125	3126	3127	3128	3129	3130	3131	3132	3133	3134	3135	3136	3137	3138	3139	3140	3141	3142	3143	3144	3145	3146	3147	3148	3149	3150	3151	3152	3153	3154	3155	3156	3157	3158	3159	3160	3161	3162	3163	3164	3165	3166	3167	3168	3169	3170	3171	3172	3173	3174	3175	3176	3177	3178	3179	3180	3181	3182	3183	3184	3185	3186	3187	3188	3189	3190	3191	3192	3193	3194	3195	3196	3197	3198	3199	3200	3201	3202	3203	3204	3205	3206	3207	3208	3209	3210	3211	3212	3213	3214	3215	3216	3217	3218	3219	3220	3221	3222	3223	3224	3225	3226	3227	3228	3229	3230	3231	3232	3233	3234	3235	3236	3237	3238	3239	3240	3241	3242	3243	3244	3245	3246	3247	3248	3249	3250	3251	3252	3253	3254	3255	3256	3257	3258	3259	3260	3261	3262	3263	3264	3265	3266	3267	3268	3269	3270	3271	3272	3273	3274	3275	3276	3277	3278	3279	3280	3281	3282	3283	3284	3285	3286	3287	3288	3289	3290	3291	3292	3293	3294	3295	3296	3297	3298	3299	3300	3301	3302	3303	3304	3305	3306	3307	3308	3309	3310	3311	3312	3313	3314	3315	3316	3317	3318	3319	3320	3321	3322	3323	3324	3325	3326	3327	3328	3329	3330	3331	3332	3333	3334	3335	3336	3337	3338	3339	3340	3341	3342	3343	3344	3345	3346	3347	3348	3349	3350	3351	3352	3353	3354	3355	3356	3357	3358	3359	3360	3361	3362	3363	3364	3365</
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Option 2.7%

BURZAI Option 2: Loan Interest = 7%											
Project Year											
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Domestic	294	1,330	1,923	1,938	942	1,878	1,963	1,963	1,963	1,963	1,963
Industrial	500	500	500	500	500	500	500	500	500	500	500
WGA	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929	1,929
Inflation rate	0.000	0.059	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (NP)	1.000	1.061	1.112	1.163	1.225	1.287	1.349	1.411	1.473	1.535	1.597
Salvage		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Domestic		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Industrial		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Domestic		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Industrial		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Operating Income		1,050	1,100	1,150	1,200	1,250	1,300	1,350	1,400	1,450	1,500
Cost of energy usage		202,920	219,850	236,780	253,710	270,640	287,570	304,500	321,430	338,360	355,290
Cost of chemicals		194,911	194,911	194,911	194,911	194,911	194,911	194,911	194,911	194,911	194,911
Wages Social Securities		82,944	82,944	82,944	82,944	82,944	82,944	82,944	82,944	82,944	82,944
Salaries		108,925	108,925	108,925	108,925	108,925	108,925	108,925	108,925	108,925	108,925
Social Insurance		75,902	75,902	75,902	75,902	75,902	75,902	75,902	75,902	75,902	75,902
Parts Maintenance		29,941	29,941	29,941	29,941	29,941	29,941	29,941	29,941	29,941	29,941
STIP		105,969	105,969	105,969	105,969	105,969	105,969	105,969	105,969	105,969	105,969
PS		94,900	94,900	94,900	94,900	94,900	94,900	94,900	94,900	94,900	94,900
Fac		5,900	5,900	5,900	5,900	5,900	5,900	5,900	5,900	5,900	5,900
Analysis cost		26,960	26,960	26,960	26,960	26,960	26,960	26,960	26,960	26,960	26,960
Others outsourcing Service		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
W & S for Administration		5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000	5,000
Salaries		344,912	344,912	344,912	344,912	344,912	344,912	344,912	344,912	344,912	344,912
Social Insurance		219,800	219,800	219,800	219,800	219,800	219,800	219,800	219,800	219,800	219,800
Depreciation		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Taxes		44,904	44,904	44,904	44,904	44,904	44,904	44,904	44,904	44,904	44,904
Net Profit		4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854
Other GVA		40,900	40,900	40,900	40,900	40,900	40,900	40,900	40,900	40,900	40,900
Pulverizer Charge		14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902
Preparation for Bad Revenues		14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902	14,902
Operating Cost		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Operating Profit		4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854	4,854
Capital Payment		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
C.A. D.T.		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Accumulate Profit/loss		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Corporate Profit Tax		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Net Profit		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Cash Flow		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Change in Working Cap		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Principal Repayment		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000
Net Cash Flow		1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000

BIRZAI (Option 2: Loan Interest = 7%)

Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (6P)	1.997	2.097	2.202	2.312	2.427	2.549	2.676	2.810	2.950	3.098	3.253	3.415	3.586	3.765
Inflation rate (9P)	2.119	2.225	2.336	2.453	2.575	2.699	2.829	2.961	3.100	3.247	3.401	3.562	3.730	3.905
Tariff	2.77	2.77	3.04	3.04	3.04	3.04	3.35	3.35	3.35	3.68	3.68	4.05	4.05	4.05
Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
Operating Income	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600	2,600
Cost of energy usage	387,809	407,199	427,559	448,937	471,384	494,953	519,701	545,686	572,970	601,618	631,699	663,284	696,449	731,271
STP	213,469	224,142	236,349	247,117	259,473	272,446	286,069	300,372	315,391	331,160	347,718	365,104	383,359	402,527
PS	174,340	183,057	192,210	201,820	211,911	222,507	233,632	245,314	257,579	270,458	283,981	298,180	313,089	328,744
Cost of chemical	141,780	148,869	156,313	164,128	172,335	180,951	189,999	199,499	209,474	219,947	230,945	242,482	254,617	267,347
Wages, Social Securities	177,435	186,307	195,622	205,403	215,673	226,457	237,780	249,669	262,152	275,260	289,023	303,474	318,647	334,580
Salaries (b)	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350
Salaries	136,408	143,313	150,478	158,002	165,902	174,197	182,907	192,053	201,655	211,738	222,325	233,441	245,113	257,369
Social Insurance	40,946	42,994	45,144	47,401	49,771	52,259	54,872	57,616	60,497	63,521	66,698	70,032	73,534	77,211
Parts, Maintenance	183,350	192,518	202,144	212,251	222,864	234,007	245,707	257,993	270,892	284,437	298,659	313,591	329,271	345,735
STP	167,740	176,127	184,933	194,180	203,889	214,063	224,787	236,027	247,826	260,219	273,230	286,892	301,237	316,298
PS	15,611	16,391	17,211	18,071	18,975	19,924	20,920	21,968	23,064	24,217	25,428	26,700	28,034	29,436
Fuel	11,657	12,240	12,862	13,495	14,170	14,878	15,622	16,403	17,223	18,084	18,989	19,938	20,935	21,982
Analysis cost	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109
Analysis cost (P)	82,861	87,004	91,355	95,922	100,718	105,754	111,042	116,594	122,424	128,545	134,972	141,721	148,807	156,247
Others outsourcing Service (b)	18,733	19,669	20,653	21,686	22,770	23,906	25,104	26,359	27,677	29,051	30,514	32,039	33,641	35,323
Others outsourcing Service (P)	596,587	626,417	657,738	690,624	725,156	761,413	799,484	839,458	881,431	925,503	971,778	1,020,367	1,071,385	1,124,954
W & S for Administration	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries (P)	458,913	481,059	505,952	531,250	557,812	585,703	614,988	645,737	678,024	711,925	747,521	784,898	824,142	865,350
Salaries	137,674	144,558	151,785	159,375	167,344	175,711	184,486	193,721	203,407	213,578	224,256	235,469	247,243	259,605
Social Insurance	319,854	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953
Depreciation	98,044	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946	102,946
Taxes	83,117	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273
Nature Protection Tax	9,261	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724
Property tax	5,665	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949
Road Tax	84,749	88,986	93,435	98,107	103,012	108,163	113,571	119,250	125,212	131,473	138,046	144,949	152,196	159,806
Other G/A	1,116	1,122	1,122	1,122	1,122	1,128	1,28	1,34	1,34	1,34	1,41	1,41	1,41	1,48
Pollution Charge (b)	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340
Pollution Charge	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508
Preparing for Bad Receivables	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964
Operating Cost	2,189,211	2,267,581	2,362,437	2,455,321	2,559,171	2,668,611	2,776,136	2,885,675	3,021,960	3,146,433	3,284,103	3,429,846	3,573,938	3,732,554
Operating Profit	410,389	332,419	237,563	144,679	80,617	24,937	24,937	24,937	24,937	24,937	24,937	24,937	24,937	24,937
Interest Payment	648,674	680,854	713,110	745,188	777,051	808,737	840,281	871,737	903,153	934,471	965,731	996,884	1,027,884	1,058,771
E.A.I.B. T	200,750	250,354	300,719	350,719	400,354	450,510	500,281	550,669	600,719	650,471	700,853	750,919	800,619	850,019
Accumulate Profit (loss)	-12,086,087	-12,338,442	-12,590,160	-12,841,829	-13,092,959	-13,344,440	-13,596,281	-13,848,484	-14,100,959	-14,353,736	-14,606,864	-14,860,384	-15,114,349	-15,368,719
Corporate Profit Tax	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103
Cash Flow	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642
Changing in Working Cap.	410,934	439,700	470,479	503,412	538,651	576,358	616,501	659,071	704,061	751,486	801,371	853,766	908,729	966,346
Principal Repayment	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103
Net Cash Flow	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103	119,103

FIRR = 4.35 %

DIRZA -Option 2 - Loan Interest = 7%

Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Domestic	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Other	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
Inflation rate (GDP)	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057	0.057
Inflation rate (GDP)	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055	0.055
Domestic	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Other	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Operating Income	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135	2,637,135
Cost of energy usage	387,809	407,199	427,559	448,937	471,384	494,953	519,701	545,986	572,970	601,619	631,699	663,284	696,434	731,124	767,344
STP	213,469	224,142	235,349	247,117	259,473	272,446	286,059	300,369	315,391	331,169	347,744	365,169	383,499	402,784	423,069
PS	174,336	182,857	192,210	201,820	211,911	222,507	233,632	245,299	257,529	270,358	283,734	297,719	312,369	327,744	343,919
Cost of Chemical	147,780	148,859	150,000	151,200	152,460	153,780	155,160	156,599	158,099	159,659	161,279	162,959	164,699	166,499	168,359
Wages Social Securities	177,435	185,207	193,522	202,403	211,853	221,883	232,503	243,723	255,543	267,963	281,003	294,683	309,003	324,003	339,703
Salaries (p)	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350	68,350
Salaries	109,085	116,857	125,172	134,053	143,503	153,533	164,153	175,403	187,193	199,553	212,503	226,053	240,203	255,003	270,503
Social Insurance	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946	40,946
Parts Maintenance	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350	163,350
STP	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740	157,740
PS	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511	156,511
Fuel	11,557	12,240	12,999	13,832	14,740	15,724	16,787	17,932	19,160	20,474	21,877	23,372	24,962	26,650	28,440
Analysis cost (P)	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109	39,109
Others outsourcing Service (p)	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842
Others outsourcing Service	18,733	19,669	20,659	21,699	22,787	23,924	25,111	26,349	27,637	28,974	30,362	31,800	33,288	34,826	36,414
W & S for Administration	595,887	626,417	658,417	691,917	726,917	763,417	801,417	840,917	881,917	924,417	968,417	1,013,917	1,060,917	1,109,417	1,159,417
Salaries (P)	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries	458,913	489,817	521,817	554,917	589,117	624,317	660,617	698,017	736,517	776,117	816,817	858,617	901,517	945,517	990,617
Social Insurance	137,674	144,558	151,786	159,375	167,344	175,711	184,496	193,721	203,407	213,578	224,256	235,499	247,245	259,545	272,345
Deviation	319,854	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853	307,853
Taxes	98,944	102,945	107,946	112,947	117,948	122,949	127,950	132,951	137,952	142,953	147,954	152,955	157,956	162,957	167,958
Nature Protection Tax	83,117	87,273	91,429	95,585	99,741	103,897	108,053	112,209	116,365	120,521	124,677	128,833	132,989	137,145	141,301
Porphyry tax	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261	5,261
Road Tax	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665	5,665
Other G/A	84,749	88,966	93,435	98,107	103,012	108,153	113,571	119,250	125,212	131,473	138,046	144,949	152,196	159,799	167,764
Pullution Charge (p)	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340
Pullution Charge	22,388	23,508	24,683	25,917	27,203	28,543	29,939	31,393	32,906	34,479	36,113	37,807	39,562	41,378	43,256
Predding for Bad Receivables	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964	63,964
Operating Cost	2,149,211	2,267,581	2,392,430	2,524,321	2,663,811	2,811,511	2,968,111	3,133,311	3,307,611	3,490,611	3,682,911	3,885,211	4,097,411	4,319,411	4,551,411
Operating Profit	487,924	369,554	244,705	112,814	-17,676	-124,376	-274,376	-428,326	-586,646	-749,266	-916,266	-1,086,646	-1,261,266	-1,440,266	-1,623,266
Interest Payment	604,674	619,908	635,729	652,156	669,281	687,106	705,731	725,156	745,381	766,406	788,231	810,856	834,281	858,506	883,531
E A I B T	-200,750	-250,354	-309,725	-368,512	-426,726	-484,376	-541,476	-598,026	-654,026	-709,476	-764,326	-818,576	-872,126	-924,976	-977,126
Accumulate Profit (loss)	-12,088,087	-12,338,442	-12,589,160	-12,840,160	-13,091,440	-13,342,990	-13,594,810	-13,846,900	-14,099,260	-14,351,890	-14,604,700	-14,857,690	-15,110,860	-15,364,210	-15,617,740
Corporate Profit Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Net Profit	-200,750	-250,354	-309,725	-368,512	-426,726	-484,376	-541,476	-598,026	-654,026	-709,476	-764,326	-818,576	-872,126	-924,976	-977,126
Cash Flow	119,103	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599
Changing in Working Cap	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642	329,642
Pre-Operational	410,934	439,700	470,479	508,651	546,656	584,111	621,016	657,371	693,176	728,431	763,136	797,291	830,906	863,981	896,516
Net Cash Flow	119,103	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599	57,599

TISA = 4.95 %

Option2.5%

BIRZA (Option 2: Loan Interest = 5%)		Project Year															
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	
Domestic		1,254	1,339	1,423	1,486	1,550	1,618	1,683	1,747	1,820	1,893	1,966	2,038	2,111	2,184	2,257	
Industrial		500	500	500	500	500	500	500	500	500	500	500	500	500	500	500	
Total		1,629	1,705	1,781	1,839	1,896	1,956	2,015	2,072	2,138	2,204	2,298	2,334	2,400	2,484	2,557	
Inflation rate		0.061	0.059	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	
Inflation rate (97%)		1.061	1.124	1.190	1.259	1.331	1.406	1.484	1.566	1.652	1.743	1.839	1.940	2.046	2.157	2.273	
Unit		2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	
Domestic		2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	2,030	
Industrial		1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	1,029	
Total		3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	3,059	
Operating Income		1,713,000	1,831,770	1,958,265	2,094,547	2,241,813	2,399,965	2,569,965	2,741,813	2,925,547	3,115,000	3,310,000	3,510,000	3,715,000	3,930,000	4,155,000	
Cost of energy usage	STP	202,929	219,852	233,449	247,885	263,033	278,905	295,517	312,874	330,987	349,861	369,506	389,934	411,156	433,177	456,000	
	PS	124,811	135,220	141,846	148,805	156,046	163,571	171,384	179,494	187,909	196,630	205,658	214,994	224,638	234,491	244,654	
Cost of chemical		78,110	84,633	91,804	99,600	108,087	117,271	127,161	136,866	147,396	157,752	168,936	180,959	193,821	207,532	222,094	
Wages, Social Securities		82,896	89,809	94,210	99,804	105,641	111,721	118,146	124,916	132,031	139,492	147,309	155,484	164,028	172,951	182,264	
	Salaries	103,742	108,930	114,376	120,095	126,100	132,405	139,005	145,900	153,090	160,584	168,392	176,514	184,950	193,701	202,767	
	Salaries	68,550	72,350	76,350	80,650	85,350	90,350	95,650	101,350	107,350	113,650	120,250	127,150	134,350	141,850	149,650	
	Social Insurance	79,802	83,792	87,982	92,381	97,000	101,839	106,987	112,444	118,211	124,288	130,675	137,372	144,379	151,696	159,324	
Parts, Maintenance	STP	23,941	25,138	26,394	27,714	29,100	30,555	32,079	33,671	35,341	37,089	38,916	40,821	42,804	44,865	46,996	
	PS	105,069	113,831	119,662	125,788	132,188	138,956	146,091	153,594	161,466	169,706	178,312	187,284	196,621	206,324	216,393	
	Salaries	90,074	96,253	101,460	106,928	112,618	118,540	124,704	131,111	137,861	144,964	152,429	160,256	168,445	176,996	185,919	
	Social Insurance	4,995	5,585	6,202	6,860	7,560	8,318	9,076	9,834	10,592	11,350	12,108	12,866	13,624	14,382	15,140	
Fuel		29,872	30,925	31,879	32,832	33,771	34,704	35,631	36,552	37,467	38,376	39,279	40,176	41,068	41,954	42,835	
Analysis cost		37,128	40,225	43,358	47,082	50,849	54,661	58,518	62,420	66,367	70,359	74,396	78,478	82,604	86,774	90,987	
	Salaries	6,776	7,191	7,607	8,022	8,437	8,852	9,267	9,682	10,097	10,512	10,927	11,342	11,757	12,172	12,587	
	Salaries	8,394	8,904	9,414	9,924	10,434	10,944	11,454	11,964	12,474	12,984	13,494	14,004	14,514	15,024	15,534	
Others outsourcing Service		340,812	366,253	384,566	403,794	423,983	445,133	467,244	490,316	514,351	539,350	565,314	592,243	620,137	649,006	678,850	
W & S for Administration		216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	
	Salaries	268,317	281,733	295,820	310,611	326,141	342,448	359,571	377,549	396,427	416,248	437,060	458,815	481,555	505,295	529,995	
	Salaries	80,495	84,520	88,746	93,183	97,842	102,734	107,871	113,265	118,928	124,874	131,118	137,669	144,525	151,696	159,181	
	Social Insurance	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	1,035,007	
Depreciation		84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	84,694	
Taxes		71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	71,800	
	Salaries	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	
	Salaries	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	4,894	
	Social Insurance	49,551	52,028	54,630	57,361	60,229	63,241	66,403	69,716	73,180	76,804	80,488	84,332	88,336	92,499	96,832	
Other G/A		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Pullition Charge(p)		14,822	15,293	15,764	16,236	16,700	17,165	17,631	18,098	18,566	19,034	19,502	19,970	20,438	20,906	21,374	
Pullition Charge		14,822	15,293	15,764	16,236	16,700	17,165	17,631	18,098	18,566	19,034	19,502	19,970	20,438	20,906	21,374	
Preparing for Bad Receivables		44,190	34,521	39,562	41,152	46,968	48,952	55,015	56,952	63,351	65,288	72,024	73,961	81,000	82,937	90,274	
Operating Profit		2,123,071	2,178,921	2,237,047	2,301,732	2,369,509	2,441,220	2,516,865	2,596,444	2,680,968	2,770,537	2,865,161	2,964,850	3,069,614	3,179,463	3,294,406	
Interest Payment		868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	868,574	
E.A.L.B.T		-1,518,636	-1,524,324	-1,537,356	-1,551,378	-1,566,391	-1,582,404	-1,599,417	-1,617,430	-1,636,443	-1,656,456	-1,677,469	-1,699,482	-1,722,495	-1,746,508	-1,771,521	
Accumulate Profit(loss)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Corporate Profit Tax		-1,518,636	-1,524,324	-1,537,356	-1,551,378	-1,566,391	-1,582,404	-1,599,417	-1,617,430	-1,636,443	-1,656,456	-1,677,469	-1,699,482	-1,722,495	-1,746,508	-1,771,521	
Net Profit		-483,029	-489,317	-496,317	-504,049	-512,430	-521,461	-531,151	-541,500	-552,509	-564,178	-576,507	-589,506	-603,175	-617,524	-632,563	
Cash Flow		184,126	6,020	25,637	6,622	29,414	29,414	29,414	29,414	29,414	29,414	29,414	29,414	29,414	29,414	29,414	
Changing in Working Cap.		184,126	190,146	215,763	222,405	251,818	299,999	266,160	303,998	312,873	321,872	331,972	343,172	355,472	368,872	383,372	
Principal Repayment		-487,755	-489,338	-496,338	-504,049	-512,430	-521,461	-531,151	-541,500	-552,509	-564,178	-576,507	-589,506	-603,175	-617,524	-632,563	
Net Cash Flow		-487,755	-489,338	-496,338	-504,049	-512,430	-521,461	-531,151	-541,500	-552,509	-564,178	-576,507	-589,506	-603,175	-617,524	-632,563	

FIRR = 5.03 %

BIRZA (Option 2: Loan Interest = 5%)		Project Year													
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Domestic	1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132	2,196
	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Industrial	1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132	2,196
	500	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Total		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Inflation rate		0.061	0.059	0.058	0.056	0.055	0.054	0.053	0.052	0.051	0.050	0.049	0.048	0.047	0.046
Inflation rate (GDP)		1.000	1.059	1.112	1.168	1.226	1.287	1.352	1.419	1.489	1.561	1.635	1.713	1.795	1.881
Inflation rate (GDP)		1.061	1.124	1.180	1.239	1.301	1.366	1.434	1.506	1.581	1.660	1.743	1.831	1.924	2.022
Total		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Domestic		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Industrial		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Total		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Operating Income		1,274	1,334	1,423	1,489	1,553	1,618	1,683	1,747	1,812	1,876	1,940	2,004	2,068	2,132
Cost of energy usage		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Cost of chemical		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Wages Social Securities		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Salaries (P)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Salaries		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Social Insurance		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Parts Maintenance		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
STP		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
PS		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Fuel		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Analysis cost (P)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Others outsourcing Service (P)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
W & S for Administration		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Salaries (P)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Salaries		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Social Insurance		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Deduction		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Taxes		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Nature Protection Tax		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Property Tax		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Road Tax		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Other GVA		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Pollution Charge (P)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Pollution Charge		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Preparing for R&D Receivables		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Overhead Cost		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Operating Profit		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Interest Payment		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
E.A. & T.		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Accumulate Profit (Loss)		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Corporate Profit Tax		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Net Profit		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Cash Flow		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Change in Working Cap		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Principal Repayment		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
Net Cash Flow		100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000

Option 2.9%

BIRZAI (Option 2: Loan Interest = 9%)		Project Year													
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Domestic	Domestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
	Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
	Industrial	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
	Total	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
		1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
Inflation rate	Inflation rate	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050	0.050
	Inflation rate (30P)	1.997	2.097	2.202	2.312	2.427	2.548	2.676	2.810	2.950	3.098	3.253	3.415	3.586	3.765
	Inflation rate (37P)	2.119	2.225	2.336	2.453	2.575	2.704	2.839	2.981	3.130	3.287	3.451	3.624	3.805	3.995
	Total	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
		1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47	1.47
Tariff	Domestic	2.97	2.97	3.27	3.27	3.27	3.60	3.60	3.60	3.96	3.96	3.96	4.35	4.35	4.35
	Industrial	2.97	2.97	3.27	3.27	3.27	3.60	3.60	3.60	3.96	3.96	3.96	4.35	4.35	4.35
	Industrial	2,900.065	2,910.072	2,919.072	2,928.072	2,937.072	2,946.072	2,955.072	2,964.072	2,973.072	2,982.072	2,991.072	3,000.072	3,009.072	3,018.072
	Domestic	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417	547.417
	Operating Income	2,832.478	2,832.478	3,113.726	3,113.726	3,113.726	3,427.268	3,427.268	3,427.268	3,770.028	3,770.028	3,770.028	4,147.031	4,147.031	4,147.031
Cost of energy usage	STP	347.809	407.193	427.559	448.937	471.344	494.953	519.701	545.686	572.970	601.618	631.699	663.284	696.449	731.271
	PS	213.469	224.142	235.349	247.117	259.473	272.446	286.069	300.372	315.391	331.190	347.718	365.104	383.359	402.527
	Cost of chemical	174.640	180.887	192.210	203.620	215.119	226.712	238.399	250.181	262.059	274.034	286.108	298.282	310.556	322.930
	Wages, Social Securities	141.780	148.869	156.313	164.128	172.235	180.551	189.079	197.819	206.774	215.947	225.330	234.924	244.728	254.742
	Total	675.678	772.099	811.431	866.684	913.691	962.961	1,014.159	1,069.358	1,127.511	1,188.642	1,252.747	1,319.896	1,389.101	1,460.370
Salaries(p)	Salaries	177.435	186.307	195.622	205.403	215.653	226.387	237.609	249.324	261.538	274.257	287.486	301.231	315.500	330.300
	Social Insurance	40.946	42.994	45.143	47.401	49.771	52.259	54.872	57.619	60.497	63.514	66.678	70.000	73.584	77.431
	STP	183.350	192.518	202.144	212.251	222.864	234.007	245.707	257.963	270.892	284.437	298.609	313.591	329.271	345.758
	PS	167.740	176.127	184.933	194.180	203.899	214.083	224.787	235.027	245.824	256.219	267.258	278.042	288.570	298.846
	Total	351.090	368.641	377.077	386.431	392.753	408.890	426.594	445.794	466.636	488.716	511.916	536.217	561.816	588.594
Analysis cost	Analysis cost	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842	8.842
	Others outsourcing Service	18.723	19.689	20.653	21.696	22.770	23.908	25.104	26.359	27.677	29.061	30.514	32.039	33.641	35.323
	W & S for Administration	596.587	626.417	657.738	690.624	725.156	761.473	799.404	839.058	881.431	925.503	971.278	1,019.760	1,071.060	1,125.194
	Salaries(P)	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600	216.600
	Total	623.952	662.718	695.043	732.920	775.624	818.522	861.624	904.932	948.457	992.191	1,036.131	1,080.381	1,124.941	1,169.817
Social Insurance	Salaries	137.674	144.558	151.766	159.375	167.344	175.711	184.496	193.721	203.407	213.578	224.256	235.469	247.242	259.605
	Social Insurance	310.854	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953	307.953
	STP	98.044	102.946	107.946	112.946	117.946	122.946	127.946	132.946	137.946	142.946	147.946	152.946	157.946	162.946
	PS	83.117	87.273	91.273	95.273	99.273	103.273	107.273	111.273	115.273	119.273	123.273	127.273	131.273	135.273
	Total	231.035	234.775	239.945	245.145	250.395	255.724	261.142	266.642	272.224	277.874	283.594	289.374	295.214	301.114
Nature Protection Tax	Property tax	9.281	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724	9.724
	Property tax	5.665	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949	5.949
	Road Tax	64.749	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986	68.986
	Other C/A	1.16	1.22	1.22	1.22	1.22	1.28	1.28	1.34	1.34	1.34	1.41	1.41	1.41	1.48
	Total	76.805	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885	85.885
Pollution Charge	Domestic	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340	19.340
	Industrial	22.388	23.508	24.683	25.917	27.213	28.583	30.039	31.583	33.213	34.928	36.730	38.620	40.599	42.668
	Industrial	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702	68.702
	Operating Cost	2,193.949	2,272.319	2,351.319	2,430.949	2,511.219	2,592.149	2,673.749	2,756.019	2,838.949	2,922.549	3,006.849	3,091.849	3,177.549	3,263.849
	Total	634.528	681.599	727.972	774.749	821.868	869.342	917.171	965.358	1,013.901	1,062.828	1,112.149	1,161.868	1,211.987	1,262.506
Interest Payment	Domestic	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981	838.981
	Industrial	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462
	Industrial	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Operating Profit	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Total	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225	1,268.225
Accumulate Profit(loss)	Domestic	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462	200.462
	Industrial	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Industrial	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060
	Operating Profit	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Total	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903
Principal Repayment	Domestic	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Industrial	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Industrial	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060
	Operating Profit	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Total	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903	673.903
Net Cash Flow	Domestic	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Industrial	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391	119.391
	Industrial	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060	354.060				

FIRR = 5.03 %

BIRZAI (Option 2: Loan Interest = 9%)

Project Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Comestic	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111	2,111
Industrial	500	500	500	500	500	500	500	500	500	500	500	500	500	500
Industrial	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400	2,400
Total	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360	1,360
inflation rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
inflation rate (60)	1.967	2.007	2.022	2.031	2.037	2.042	2.046	2.049	2.051	2.053	2.054	2.055	2.056	2.057
inflation rate (57.5)	2.116	2.226	2.302	2.403	2.515	2.638	2.774	2.921	3.079	3.247	3.424	3.609	3.801	3.999
Land	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97
Comestic	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97
Industrial	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97
Domestic	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97
Industrial	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97	2,97
Operating Income	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478	2,832,478
Cost of energy usage	387,905	407,196	427,559	448,037	468,643	489,384	510,261	531,274	552,424	573,718	595,154	616,732	638,454	660,321
STP	215,469	224,142	233,349	243,117	253,473	264,431	275,999	288,186	300,994	314,524	328,779	343,761	359,481	375,949
US	174,240	180,051	186,312	193,029	200,207	207,853	215,974	224,577	233,669	243,254	253,340	263,934	275,044	286,676
Cost of chemical	141,780	146,869	152,312	158,124	164,307	170,871	177,825	185,178	192,940	201,119	209,715	218,737	228,184	238,066
Wages Social Securities	177,435	183,350	189,722	196,559	203,874	211,674	219,966	228,757	238,054	247,864	258,191	269,042	280,425	292,348
Salaries(p)	58,350	60,350	62,350	64,350	66,350	68,350	70,350	72,350	74,350	76,350	78,350	80,350	82,350	84,350
Salaries	136,488	143,313	150,472	157,904	165,524	173,324	181,324	189,524	197,924	206,524	215,324	224,324	233,524	242,924
Social insurance	40,946	42,994	45,143	47,401	49,771	52,251	54,841	57,541	60,361	63,301	66,361	69,541	72,841	76,261
Parts Maintenance	183,350	192,518	202,144	212,231	222,884	234,019	245,634	257,739	270,344	283,459	297,084	311,219	325,864	341,019
STP	167,740	176,127	184,933	194,180	203,889	214,063	224,702	235,817	247,419	259,519	272,119	285,219	298,819	312,919
PS	11,611	12,391	13,211	14,071	14,971	15,911	16,891	17,911	18,971	20,071	21,211	22,391	23,611	24,871
Paul	11,657	12,440	13,267	14,139	15,055	16,015	17,019	18,067	19,163	20,307	21,499	22,739	24,027	25,363
Analysis cost (P)	87,861	91,109	94,355	97,601	100,847	104,093	107,339	110,585	113,831	117,077	120,323	123,569	126,815	130,061
Others outsourcing Service	19,733	19,669	19,605	19,541	19,477	19,413	19,349	19,285	19,221	19,157	19,093	19,029	18,965	18,901
W.A.S for Administration	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842	8,842
Salaries(P)	666,587	628,417	651,736	690,624	735,156	785,413	842,558	906,603	976,648	1,052,693	1,134,738	1,222,783	1,316,828	1,416,873
Salaries	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600	216,600
Salaries	429,913	411,817	435,136	474,024	518,556	568,813	625,958	689,003	758,048	836,093	926,138	1,036,183	1,160,228	1,300,273
Social insurance	137,674	144,599	151,795	159,375	167,344	175,711	184,466	193,611	203,156	213,101	223,446	234,191	245,336	256,981
Depreciation	319,894	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953	307,953
Taxes	98,044	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546	107,546
Nature Protection Tax	83,117	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273	87,273
Property tax	9,261	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724	9,724
Road Tax	5,665	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949	5,949
Other GFA	84,743	86,986	89,435	92,107	95,012	98,163	101,558	105,299	109,384	113,721	118,311	123,156	128,266	133,641
Pulmon Challop	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340	19,340
Pulmon Challop	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508	23,508
Preparing for Bad Receivables	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702	68,702
Operating Cost	2,193,949	2,273,319	2,367,640	2,468,333	2,575,353	2,688,784	2,808,634	2,934,999	3,067,884	3,207,399	3,354,544	3,508,829	3,670,254	3,838,829
Operating Profit	638,529	559,159	464,838	364,145	257,125	143,694	24,844	-113,521	-258,404	-425,180	-596,015	-770,255	-947,220	-1,124,650
Interest Payment	836,991	866,746	897,591	928,436	959,281	990,126	1,020,971	1,051,816	1,082,661	1,113,506	1,144,351	1,175,196	1,206,041	1,236,886
C.A.I.B.T	-200,462	-246,587	-292,712	-338,837	-384,962	-431,087	-477,212	-523,337	-569,462	-615,587	-661,712	-707,837	-753,962	-800,087
Accumulate Profit(loss)	-12,657,448	-12,504,035	-12,350,622	-12,197,209	-12,043,796	-11,890,383	-11,736,970	-11,583,557	-11,430,144	-11,276,731	-11,123,318	-10,969,905	-10,816,492	-10,663,079
Corporate Profit Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nat Profit	-200,462	-246,587	-292,712	-338,837	-384,962	-431,087	-477,212	-523,337	-569,462	-615,587	-661,712	-707,837	-753,962	-800,087
Cash Flow	119,391	61,367	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406
Changing in Working Cap	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050	354,050
Principal Respayment	359,270	390,524	423,671	458,781	495,856	534,986	576,171	619,411	664,706	712,051	761,446	812,891	866,386	922,931
Net Cash Flow	119,391	61,367	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406	35,406

FIRR = 5.03%

## **12. Supporting Report for the Environmental Impact Assessment**



**Supporting Report (Birzai)  
Environmental Impact Assessment**

**Table of Contents**

<b>1.</b>	<b>Introduction .....</b>	<b>12-1</b>
1.1	Objective of the EIA Study	
1.2	Approach and Methodology	
1.3	Data Collection	
1.4	The Project	
1.5	Organizations/Agencies related to Environment in Lithuania	
1.6	Environmental Laws and Regulations in Lithuania	
1.7	EIA Procedure and Objective Categories in Lithuania	
	1.7.1 EIA Procedure	
	1.7.2 Objective Categories of EIA	
1.8	International Conventions on Environmental Protection	
<b>2.</b>	<b>Environmental Baseline Conditions .....</b>	<b>12-9</b>
2.1	Location and Area	
2.2	Climate	
2.3	Topography and Geology	
2.4	Rivers and Lakes	
2.5	Ecology	
2.6	Land Use and Land Ownership	
2.7	Water Supply and Sanitation	
2.8	Drainage, Sewerage and Waste Disposal	
2.9	Protected Area and Other Significant Site	

## **1 INTRODUCTION**

### **1.1 OBJECTIVE OF THE EIA STUDY**

An “environmental impact” means a probable change in environment caused by proposed activities and structures. “Environmental impact assessment (EIA) ” means the process of identification, prediction, and assessment of potential impact by the proposed activities and structures on the environment.

Objective of an EIA is to assess anticipated environmental impacts, which may result from implementation of the proposed sewerage project, and to prepare recommendations on necessary countermeasures to mitigate identified impacts.

Another objective is to provide the study results of an EIA to the Lithuanian proponent sides to take necessary procedures for an official approval on the EIA according to the Lithuanian law.

### **1.2 APPROACH AND METHODOLOGY**

The general sequence of steps adopted in conducting an EIA is as follows:

Step 1: Understanding the project features

Step 2: Study the environmental laws, regulations and guidelines

Step 3: Collection and review of the existing reports and data on the environment

(Including the preliminary EIA by the JICA preliminary mission.)

Step 4: Survey of various environmental conditions in the project areas

(Such as major pollution sources, waste disposal, proposed sites, rivers & lakes, existing facilities, etc.)

Step 5: Identification of environmental impacts

Step 6: Supplementary/additional investigation on the identified impacts

Step 7: Study and evaluation of environmental impact assessment

Step 8: Study of mitigation measures

Step 9: Recommendation on environmental management

### **1.3 DATA COLLECTION**

The JICA Team carried out data collection in Lithuania generally in the following manners:

(A) Field reconnaissance in and around the project areas

(a) Birzai town and the surrounding area

(b) Skuodas town and the surrounding area

Note: Excluding the territory of Latvia, although the project in Skuodas includes an international issue for the Bartuva River.

(B) Visit to the environmentally critical or significant areas/locations

- (a) Existing sewage treatment plants (STP)
- (b) Proposed STP sites (including alternative sites)
- (c) Rivers and lakes/reservoirs in the project areas  
(Especially the proposed alternative effluent discharge locations.)
- (d) Major pollution sources  
(Such as major factories and hospitals)
- (e) Waste disposal site  
(Solid waste and liquid/sludge waste)
- (f) Protected areas

**(C) Visit to the offices concerned (Major offices are listed below:)**

- (a) Ministries of Environment
  - Environmental Impact Assessment Division
  - Geological Survey
  - Joint Research Center
  - Fish Resources Department
  - Water Division
  - Department of Forest and Protected Territories
  - Department of Biodiversity
  - Hydrometeorological service
- (b) Birzai Vandenys
- (c) Skuodas Vandenys
- (d) Municipality office of Birzai
- (e) Municipality office of Skuodas
- (f) Others (Central hospital of Skuodas, Human Health Center in Birzai, etc.)

The data collection was made through observation, measurement, and discussion with people (or staff) at respective location (or office). A checklist (or questionnaire) was used for the data collection during the field activities.

#### **1.4 THE PROJECT**

The detailed plan and design is presented in the main report. The salient features of the project facilities and works are presented as follows:

**(1) Project in Birzai**

- Design year : 2010
- Planned service area : Inside the urban area ( 1,783 ha )
- Population served : 11,720 (in 2010)
- Amount of sewage (2010) : Daily average 4,200 m<sup>3</sup>

Daily maximum 5,000 m<sup>3</sup> (Design flow)  
Hourly maximum 6,850 m<sup>3</sup>

- Proposed STP site: The site proposed for the original plant located approximately 2 km southwest from the town area.
- Area of the STP : Approximately 3 ha
- Sewage treatment plant : Anaerobic-anoxic-eration(A2O) system
- Sewer system : Existing system is used.
- Discharge location of the treated effluent : Option 1 ; Juodupe river, a tributary of Tatula river, Option 2 ; Obelaukias River
- Treatment of sludge : Gravity thickening and mechanical dewatering using a centrifuge
- Disposal of dewatered sludge : 4.6 m<sup>3</sup>/day, Transported outside for composting treatment
- Use of the existing plant : Abandoned after completion of the project
- Tertiary treatment : Biological membrane filter for the secondary effluent (Option 2 only).

## (2) Project in Skuodas

- Design year : 2010
- Planned service area : Inside the urban area ( 596 ha )
- Population served : 8,340 (in 2010)
- Amount of sewage (2010) : Daily average 1,270 m<sup>3</sup>  
Daily maximum 1,600 m<sup>3</sup> (Design flow)  
Hourly maximum 3,200 m<sup>3</sup>
- New STP site: The originally proposed site located at approximately 200 m west from the town area, called Kanyzelis district.
- Area of the STP : 1.8 ha
- Sewage treatment plant : Oxidation ditch method
- Sewer system : Existing system is used.
- Discharge location of the treated effluent : Bartuva river
- Treatment of sludge : Gravity thickening and mechanical dewatering using a centrifuge
- Disposal of dewatered sludge : 3.0 m<sup>3</sup>/day, Mounting composting method and stored for agricultural use
- Use of the existing two plants : Abandoned after the completion of project

## 1.5 ORGANIZATIONS/AGENCIES RELATED TO ENVIRONMENT IN LITHUANIA

The major organizations/agencies concerned for the environmental study are listed as follows:

- a) Ministry of Environmental (Former Ministry of Environmental Protection)
- b) Ministry of Health Protection
- c) Fire Protection Department of the Ministry of Domestic Affairs
- d) Regional government offices
- e) Municipal government offices [Birzai and Skuodas]

The Ministry of Environment (MOE) is the main and most significant organization for the environmental protection in Lithuania. The organization of the ministry was strengthened in 1998.

That is, the ministry was united with the former Ministry of Construction. Name of the ministry was changed from the Ministry of Environmental Protection (MEP).

## **1.6 ENVIRONMENTAL LAWS AND REGULATIONS IN LITHUANIA**

The Lithuanian laws and regulations related to environmental protection are listed as follows:

- a) Law on Environment Protection (1991, as revised in 1996)
- b) Law on Environmental Impact Assessment (August 1996)
- c) Government Resolution No.456 of 12 May 1997 concerning the approval of the list of proposed activities and projects that shall be made subject to the full environmental impact assessment.
- d) Government Resolution No. 1305 of 11 November 1996 on the approval of the order of informing the public about the proposed activity and implementing the proposals of the public.
- e) Government Resolution No. 233 of 17 March 1997 concerning the approval of the list of proposed activities and projects that shall be made subject to the state expertise of environmental impact assessment.
- f) Government Resolution No. 1079 of 18 September 1996 on the approval of regulations regarding public hearings on the territorial planning documentation projects.
- g) Republic Building Norms RSN 153-93
- h) The Building Law
- i) The Water Law(October 1997)
- j) Law on Taxes on State Owned Natural Resources
- k) Law on Taxes on Environmental Pollution
- l) Law on Drinking Water (draft)
- m) Law on Territorial Planning
- n) Law on Reclamation
- o) Land Law
- p) Environmental Monitoring Law (draft?)
- q) Law on Protection of Marine Environment (draft?)
- r) Code on the Internal Water Transport
- s) Code on the Violation of Administrative Right
- t) Guidelines on the Establishment of Water Bodies Protection Zone
- u) Conditions of the Use of Special Land and Forest
- v) Regulations of drawing up a Program and Report on Comprehensive Evaluation of Impact of Planned Business Activity on the Environment(March 1998)

- w) Resolution No. 1486 of December 29, 1997 concerning Establishment of New Reservations and Approval of Reservations List
- x) Order of the Ministry of Environmental Protection No. 127 of 24 July 1997 concerning Environment Protection Standard Document "Waste Water Pollution Standards" (LAND 10-96)
- y) Regulation for Issue of Permission for Use of Natural Resources and setting of Standards concerning Limits of Use of Natural Resources and Discharge of pollutants into the Environment.

"Law on Environment Protection of the Republic of Lithuania" was legislated in 1991. Amendment and supplement of the law was prepared in 1996. The law aims at the following matters:

- To regulate public relations in the environmental protection field,
- To define the main rights and duties of legal persons,
- To preserve biological diversity characteristics to Lithuania, ecological systems and landscape,
- To ensure healthy and clean environment, and
- To assure rational use of natural resources in Lithuania, including its territorial waters, continental shelf and economic zone.

"Law on Environmental Impact Assessment of the Republic of Lithuania" adopted on August 15, 1996 aims to provide regulations for the evaluation of a proposed activity which may cause negative impact on the environment and also to regulate relationships between parties involved in the process.

Beside the laws, "Lithuania's Environmental Protection Program" was established in 1995. This program was prepared by the MEP and officially approved by the Lithuanian Republic Parliament in 1996, consisting of the following three volumes:

- Vol. 1 Strategy motivation, which contains the present environmental status assessment, national economy sector's review, environmental change trends' forecast, and a description of the institutional, legal and economic system in the environment sector
- Vol. 2 Strategy methodology, which formulates the strategy concept based upon environmental status analysis, presents the techniques selected for the assessment of environmental problems, their urgency and implications, outlines priority goals.
- Vol. 3 Action Program which presents the long-term strategy and short and medium-term action program in relation to environmental components. It also includes strategy implementation means, environmental protection funding aspects, etc.

## **1.7 EIA PROCEDURES AND OBJECTIVE CATEGORIES IN LITHUANIA**

### **1.7.1 EIA Procedure**

The EIA procedure is explained in the law on EIA. An EIA is carried out generally in the following procedure:

- (a) Initial EIA to be conducted in the process of preparation of documents on territorial planning and project proposals.
  - To be prepared by the proponent;
  - To be included in the territorial planning as well as the project proposal for the decision of the relevant parties of EIA;
  - To be presented to the public for their comments.
- (b) Full EIA to be conducted in the preparation of technical proposals for the proposed activities and objects included in the list prepared by the MEP and adopted by the government, and also for a proposed activity recommended in the initial EIA.
- (c) Full EIA program is to be prepared by the proponent in accordance with special regulations issued and approved by the MEP.
  - To be submitted to the relevant parties of the EIA for approval and presented to the public.
  - To be submitted to the MEP for ratification taking into account the public comments.
- (d) EIA report is to be prepared under the EIA program
  - To be submitted to the relevant parties which check whether the full EIA report meets requirements of the adopted program within one month, and forward the conclusions to the proponent.
  - To be submitted to the MEP, together with conclusions issued by other relevant parties of the EIA , with analysis of public comments.
- (e) MEP examines the EIA report.
  - To be examined in consideration of the conclusions issued by other institutions that have also examined the report.
  - To forward its decision and reasons to the proponent in a written form within one month.
- (f) MEP shall make a decision concerning the proposed activities for which the State Expertise on the EIA is mandatory only if the State Expertise procedure has been performed. The State Expertise of the EIA is obligatory for the proposed activities and objects included into the list, which is prepared by the MEP and adopted by the Government. Only licensed EIA experts organized by the MEP may perform State Expertise.

Note: The MEP is the former body of the MOE.

### **1.7.2 Objective Categories of EIA**

The list of proposed activities and projects that shall be made subject to a full environmental impact assessment is approved in the resolution No.456 of May 12 1997 as follows:

To approve the list (To be attached in the data book) of the categories of proposed activities and projects that shall be made subject to a full EIA.

A) To set that:

- 1 The proposed activities or projects listed in the aforementioned list shall be made subject to a full EIA if at least one of the following criteria are met:
  - (a) Production capacities or other indices match the value defined in the list;
  - (b) The volume of water consumed exceeds 250 cubic meters per 24 hours;
  - (c) The volume of waste water or sewage exceeding 100 cubic meters per 24 hour;
  - (d) The annual volume of emissions into the atmosphere exceeds 50 tons;
  - (e) During the production process, emissions belonging to the I and II risk categories are emitted into the atmosphere; and
  - (f) The annual volume of hazardous waste produced exceeds 5 tons
- 2 The environmental study on construction shall be prepared according to the Republican Construction Standards and coordinated according to the established order, for the categories of proposed activities and projects that are not subject to a full EIA pursuant to paragraphs above yet do have negative effects on the environment or use natural resources, as well as for the constructions planned to be erected on the territories of national parks and nature reserves,

An EIA is to be prepared in line with the EIA laws, regulations and guidelines of Lithuania and based on the results of survey. According to the law explained above, the proposed projects for Birzai and Skuodas are definitely categorized as projects subject to a full EIA, as the project facilities will discharge sewage exceeding 100 cubic meters per 24 hours.

### **1.8 INTERNATIONAL CONVENTIONS ON ENVIRONMENTAL PROTECTION**

Although Lithuania has not ratified all international conventions aimed at the protection of environment, it has ratified the following:

- (a) Convention on Biodiversity (1995)
- (b) European Convention on Wildlife protection (Bern Convention, 1996)

Lithuania has acceded (already signed but not ratified yet) the following:

- (a) Convention on the Protection of Wetlands of International Importance Particularly Waterfowl (Ramsar Convention, 1993)



- (b) Convention on Fisheries and the Protection of Fish Resources in the Baltic Sea and Protection Belts (1992)
- (c) Baltic Sea Marine Environment Protection Convention (HELCOM, 1974)

The Ministry of Environmental Protection (now changed to the Ministry of Environment) has signed cooperation agreements in environmental protection, and biodiversity conservation with the following:

- (a) Environmental Protection and Energy Ministry of Denmark (1991)
- (b) Environmental Protection Natural Resources and Forestry Ministry of Poland (1992)
- (c) Environmental Protection Ministry of Finland (1992)
- (d) Environmental Protection Ministry of Germany (1993)
- (e) Federal Ministry for the Environment, Youth and Family of Austria (1994)
- (f) Nature Resources and Environmental Protection Ministry of Belourussia (1995)
- (g) Environmental Ministry of Slovak Republic (1996)

The Government of Lithuania has signed cooperation agreements in environmental protection, and biodiversity conservation with the following:

- (a) Bilateral agreement with Sweden for cooperation in environmental protection with Sweden (1992)
- (b) Trilateral agreement for cooperation in environmental protection with Estonia and Latvia (1995)

## 2 ENVIRONMENTAL BASELINE CONDITIONS

### 2.1 LOCATION AND AREA

The Municipality of Birzai is located facing the northern border with Latvia and approximately 200km away from Vilnius in a north-northwest direction. The municipality belongs to the Panevėžys Region, which consists of five municipalities. The Birzai town is the capital of the municipality and located almost in the center of the municipality area.

The study area for the EIA is the area of Birzai town and the surrounding area. The study area is located in the territory of the municipality of Birzai, except for those rivers, which flow into or out of the municipality, or to Latvia. In case of water pollution in rivers, the areas upstream and downstream of the project area have to be covered in the investigation.

The area of the municipality and the town is as follows:

- Municipality of Birzai: 147,625 km<sup>2</sup> in area (2.26% of the country area)
- Town (District) of Birzai: 17.83 km<sup>2</sup> in area
- Lithuania (Country): 65,301 km<sup>2</sup> in area

### 1.2 CLIMATE

Records of monthly mean air-temperature, summary of long-term records of temperature, monthly precipitation, summary of long-term records of precipitation, and monthly mean humidity are shown in the following tables:

Monthly Mean Temperature (Birzai)

Unit: °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean
1994	-0.7	-9.7	-0.6	8.1	10.4	13.9	20.1	17.3	13.3	5.4	1.1	-1.1	6.5
1995	-3.6	1.2	1.8	6.5	11.6	17.9	17.5	17.2	12.0	8.4	-1.2	-3.7	7.1
1996	-7.7	-9.4	-3.7	6.5	11.7	14.2	14.7	18.0	9.8	6.0	4.0	-6.2	4.8
Mean	-4.0	-6.0	-0.8	7.0	11.2	15.3	17.4	17.5	11.7	6.6	1.3	-3.7	6.1

### Summary of Long-term Records of Temperature (Birzai)

Unit: °C

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	8.4	13.0	18.8	26.1	30.7	33.3	33.7	33.3	28.9	22.7	16.2	10.5
Minimum	-35.1	-35.5	-29.5	-16.7	-4.1	0.1	3.5	0.4	-5.3	-10.8	-20.4	-31.4
Mean	-5.7	-5.2	-1.2	5.5	12.1	15.7	16.7	15.9	11.4	6.7	1.5	-3.2

(Records : 1925-1944 and 1947-1990 )

### Monthly Precipitation (Birzai)

Unit: mm

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1994	51	24	61	67	55	59	2	41	81	46	83	57	627
1995	53	49	71	44	69	76	34	37	66	57	29	28	613
1996	18	42	8	11	98	18	58	21	34	73	111	92	584
Mean	41	38	47	41	74	51	31	33	60	59	74	59	608

### Summary of Long-term Records of Precipitation (Birzai)

Unit: mm/month

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum	80	69	87	102	150	197	183	220	157	136	135	90
Minimum	9	6	4	6	14	21	25	15	0	4	8	9
Mean	32	24	34	40	52	58	77	71	64	55	52	46

(Records : 1924-1990 excluding some years)

### Monthly Humidity (Birzai)

Unit: %

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean
Mean	84	82	79	74	69	72	77	79	83	85	88	87	80

(Note: 1961-1990 records)

The climate in the study area is characterized as follows:

- Temperatures from April to October are generally moderate.
- Temperatures from November to March are low. They go below zero from December to March.
- Long term records of temperature show that there are large differences between the maximum and the mean as well as between the minimum and the mean. Temperatures higher than 33°C have been recorded in June, July and August while temperatures lower than -30°C have been recorded in December, January and February.
- Annual average precipitation is nearly 600 mm, which is relatively small.

- Long-term records of precipitation show that there is no remarkable difference in a year, although there are some variations by year or by month. The maximum annual precipitation is 921 mm, the minimum 434 mm, and the mean 605 mm in the records of 1924 -- 1990. The maximum monthly precipitation is 220 mm.
- There is no definite rainy season. Variation in monthly rainfall is not remarkable all the year round.
- There is no considerable variation in monthly humidity, although the humidity in winter is higher than that in summer. Monthly mean humidity ranges from 69 % to 88 %.
- The prevailing wind direction in Birzai is recorded as follows:

Summer season: West or Southwest

Winter season: South, Southwest, or Southeast

### **1.3 TOPOGRAPHY AND GEOLOGY**

The municipality of Birzai gently descends from the southern-east side with the highest level of El. 88m to the northern-west side with the lowest level of El. 21m. The topography is generally flat but with some undulations.

The north-eastern region (Birzai, Panevėžys and Pasvalys districts) of Lithuania is characterized by karst-forms, mostly covered by silt or peat deposits. The territory where subsurface geological section is composed of soluble rocks, such as limestone, dolomite and gypsum, is called a karstic region. The Birzai municipality is mostly located on the gypsum karst terrain with vulnerable geological environment and contains a dense network of sinkholes, land-subsidence and karst lakes.

The Karst area generally has high permeability and unstable layers. The polluted water can be transported widely through the underground water of Karst-forms, and cause groundwater contamination. It also causes subsidence and failures in construction as well as affecting the landscape and limiting the intensive use of land.

### **1.4 RIVERS AND LAKES**

The major rivers for the study are listed, in order, from east to west as follows:

#### **(a) Roveja River**

The river, with a length of 38.1 km and a catchment area of 190.8 km<sup>2</sup>, runs from southeast to northwest and join the Apascia River at the northern side of the Sirverios Lake.

#### **(b) Apascia River**

This river has a total length of 90.7 km and a catchment area of 894.1 km<sup>2</sup>. The river runs from east to west, turns to the north, and enters the Sirverios Lake after running through the town area. The Apascia River further flows north from the outlet of the

lake and joins the Lielupe River, one of the most representative rivers in Latvia finally flowing into Riga bay through the city of Riga.

**(c) Agluona River**

The river, with a length of 21.1 km and a catchment area of 82.9 km<sup>2</sup>, runs from south to north through the town and joins the Sirverios Lake.

**(d) Juodupe River**

The river, with a length of 24.2 km and a catchment area of 68.5 km<sup>2</sup>, runs from the south towards the north on the southwest side of the town, turns to the north on the way, and join the Tatula River. The river is small in scale and is better to be called a stream or a rivulet. It is, however, significant for the project, as the existing sewage treatment plant discharges effluent into the Juodupe River through a drainage canal and culvert.

**(e) Tatula River**

The river, with a length of 64.7 km and a catchment area of 453.4 km<sup>2</sup>, runs from south to north, turns west on the way, and joins the Musa River, after collecting tributaries, including the Juodupe River. The Musa River is a major tributary of the Lielupe River that flows into Riga bay through the city of Riga.

**(f) Sirvenos Lake**

There are 15 lakes and 32 man-made reservoirs in the Municipality of Birzai. However, most of them are small in area. Sirvenos lake, actually a man-made reservoir, is the biggest and located in the project area. The lake is often called "Birzai Lake", as Birzai town is located along the south side of the lake. The lake has a surface area of 332.3 ha. Both the Apascia and Agluona Rivers run into the lake from the south while the Apascia River runs out of the lake towards the north.

The municipality of Birzai is located near the international border with Latvia. The rivers running through the municipality flow into the Latvia territory and finally to the Baltic Sea (Riga bay). Accordingly, attention should be paid also to impacts on the next country as well as on the Baltic sea.

## **1.5 ECOLOGY**

According to the bio-geographical regions of Lithuania, the study area is located in the "Ziemgala Lowland Unit", which is characterized by broad-leaved spruce forest and broad-leaved forest and dry meadows on loamy plains of agrarian landscapes, abounding in carbonates. In addition, the municipality is located in a significant area for biological diversity conservation by the MOE.

The Lithuanian Red Data Book prepared in 1992 includes 501 species, consisting of 210 plants, 210 animals and 81 fungi. These species are grouped into six categories according to their rarity. There is, however, no specific survey data for the ecology in the Birzai area. No survey has been carried out in Birzai on the location of habitats and the number of significant species, except for fishes.

According to an interview with officials concerned, there are no endangered fauna and flora living in the Birzai area. They stated that there are beavers and otters living in, and along, the rivers, but they are not protected as they cause damages to forest trees and agricultural products. In addition, they indicated the importance of keeping the river water clean so that the number and species of fish may increase. For example, crayfish can live only in clean water, therefore these can be a kind of barometer of water quality.

According to the survey (1994) of rivers and lakes by the Fish Resources Department of the MOE, the amphibian mammals are living in the following rivers:

- (a) Otter : Agluona, Apascia, Tatula
- (b) Beaver : Agluona
- (c) Mink : Tatula

According to the survey on rivers and lakes by the Fish Resources Department of the MOE, information concerning the types of fish fauna in rivers in the municipality of Birzai is as follows:

- (a) Twenty four fish species live in the rivers and 22 species are of local origin.
- (b) There is no typical rheophilous salmon fish species.
- (c) Average biomass of fish in the rivulets may vary from 20 to 50 kg/ha, fish density- from 1,500 to 2,000 specimen/ha.
- (d) In the medium and large rivers such as the Apascia and Tatula, the dominant species are roach, chub, perch, pike, bleak, gudgeon, torrent bleak. Fish biomass in rivers of this type (medium size, warm water) may vary from 40 to 100 kg/ha. Average density of fish in such rivers may vary from 2,000 to 3,000 specimen/ha.

There are many migrating birds stopping over in Lithuania, including the Birzai territory. There are 321 bird species recorded in Lithuania, of which 213 breed or have bred in Lithuania. Of 213 bird species, 53 show decreasing populations. Wetland drainage has had a drastic impact in the past. The changes in habitat have reduced the number of birds nesting in shrub thickets and meadows by 90 percent, and in shrub and forest by 70 and 40 percent, respectively. The modifications to ecosystems due to economic activities have also had an adverse impact on the migration routes and wintering sites of migrating birds.

## 1.6 LAND USE AND LAND OWNERSHIP

The land use condition in the municipality of Birzai as of 1996 is summarized in the following table:

Description	Area (ha)	Area (%)
1. Agricultural land		
(1) Cultivated land	81064	(54.9)
(2) Grass land/Pasture	12,054	(8.2)
(3) Orchard/Strawberry	760	(0.0)
Sub-total of 1.	93,878	63.6
2. Other use	53,747	36.4
Total Area	147,625	100.0

As seen in the table, the agricultural land covers nearly 64 percent of the whole administrative area of Birzai.

The land ownership is classified in to the following categories in general:

- (a) Private land
- (b) State land
  - Rented/Leased
  - Not rented/leased

The proposed STP site is state land (not rented).

## 1.7 WATER SUPPLY AND SANITATION

The water supply conditions in Birzai are as follows:

- In the urban area, groundwater is pumped from deep wells (approximately 150m deep). Iron contained in the water is removed by a new treatment facility constructed in July 1997. Before then, the groundwater was supplied directly to the town.
- Iron (Fe) content is generally 1.50 mg/l – 0.8 mg/l in the raw water and generally 0.1 mg/l – 0.3 mg/l after treatment (finished water).
- The water system serves nearly 8,000 people, approximately 50 percent of the urban area.
- The maximum capacity of the water supply system is 3,000 m<sup>3</sup>/day, while the actual use is 1,000 to 1,500 m<sup>3</sup>/day, at present.
- The houses, buildings, and factories not connected to the water supply system generally use deep or shallow wells.
- The Water Company in Birzai manages the water supply as well as the sewerage.

There are no remarkable defects of sanitation for the water from the deep wells. However, water quality from the shallow wells has been deteriorating due to the use of fertilizer and

pesticides for agricultural activities, although the quantity of such chemicals has been remarkably reduced by the strict regulation. The survey results in 1994 show the following condition:

Item	Urban area	Surrounding area
Total No. of well surveyed	13 wells	6 wells
Exceeding the standard of NO <sub>2</sub> -N(45mg/l)	9 wells	2 wells
Exceeding the standard of NO <sub>3</sub> -N(3.3mg/l)	1 well	0
Exceeding the standard of NH <sub>4</sub> -N(2.0mg/l)	2 wells	1 well

There are no reports of local diseases in, and around, the study area. According to the chief doctor of the Human Health Center of DOH in Birzai, water related diseases have been decreasing over the years, although it does not mean that the drinking water became cleaner.

### 1.8 DRAINAGE, SEWERAGE AND WASTE DISPOSAL

The drainage system for rainwater is separated from the sanitary sewerage system. Approximately 28 to 37 percent of rainwater is drained directly to the rivers and lakes over the ground surface or in ditches. The remaining water seeps into the ground or evaporates.

The existing sewerage system was established in the early 1960's and consists of 27 km of sewer pipelines, four pump stations, and a treatment plant. The existing treatment plant has a capacity of 2,600 m<sup>3</sup>/s. Daily sewage volume is approximately 2,200 m<sup>3</sup>/s on an average. The Birzai Water Company has 560 connections and serves 51 percent (8,240 people) of the total population. Effluent from factories located in the town area is collected in the sewer network. The sewerage system covers almost the entire town area except for a part of the residential area that has been developed in recent years. The existing sewage treatment plant is located nearly 2 km southwest of town. The plant facility is composed of a receiving box and inlet channel, sedimentation tank, biological filter, aerated lagoon, stabilization pond, sludge lagoons, and a blower building.

Treated effluent is released from the treatment plant to the Juodupe River through a conduit approximately 2 km long. The Juodupe River joins the Tatula River about 4.5 km downstream from the effluent discharge point. The sludge produced in the plant is stored in sludge ponds. The sludge is not utilized for farming and just kept in the ponds at present. The treatment efficiency of present facilities is low due to poor maintenance and old facilities. That is, the treated water released to the river is still polluted as seen in the water quality test record from July 1996 to June 1998. The mean values of major items are shown below:

Item	BOD7	SS.	T-N	T-P
Inflow (mg/l)	509.8	239.8	43.9	5
Outflow (mg/l)	194	61.7	32.4	3.9



The construction of a new treatment plant was started in 1993 at the proposed 6 ha site located approximately 2 km south of the town. Work was suspended in 1995 due to shortage of funds. A new treatment plant with a capacity of 5,000 m<sup>3</sup>/day (daily maximum) will be required within a few years according to the study prepared by the JICA team. Then, the existing plant will be abandoned. The new plant has sufficient capacity to treat the sewage for the year of 2010.

In addition to the treatment plants for public use (by Birzai Water Company), there are two treatment plants, as explained below:

**(a) STP of a Dairy Factory**

This treatment plant is located approximately 6 to 7 km northeast of the town area, in the Medeikiai village and is exclusively used for a dairy factory. Effluent is discharged into the Roveje River. The plant capacity is 1,000 m<sup>3</sup>/day. Present use of the plant is 600 to 700 m<sup>3</sup>/day in summer and 300 to 400 m<sup>3</sup>/day in winter. The water quality of the effluent is sometimes over the required standard, however the system is performing well in comparison with the Water Company treatment plant.

**(b) STP of a Linen Factory**

A linen factory located on the northeast side of the Sirvenos Lake exclusively uses this treatment plant. Effluent from the treatment plant is discharged into the Apascia River at about 3 km northeast of the factory.

There are two waste disposal sites for the town as follows:

**(a) Solid waste disposal site**

The site is located in the rural area, approximately 3 km south of the town area. A forest and an agricultural field surround the area. This site has been used for nearly 25 years. There are no data of waste volume or the site scale. The site area is 2 to 4 ha. The site was a depression with unknown depth. There is no separation of waste. Burning was carried out temporarily in the past. It was however suspended due to objections from the Ministry of Environmental Protection. There is no significant odor at the site although there are many flies.

**(b) Liquid waste disposal site**

The site is located approximately 0.5 km northwest of the Sirvenos lake. The site has four ponds. The largest pond is about 1 ha and 6 to 10 m deep. The other three ponds are smaller in scale. The ponds have no capacity to accept additional wastes, except through volume reduced naturally by seepage into the ground and evaporation. The ponds are generally used for disposal of sludge from factories and effluent from households not connected to the sewerage system. A forest and an agricultural field surround the area.

However, there are some houses located not so far from the site. The inhabitants complain about the odor from the pond. The odor is strong near the ponds.

## **1.9 PROTECTED AREAS AND OTHER SIGNIFICANT SITES**

The legally protected areas aim to conserve and restore the following:

- (a) Nature and culture heritage features
- (b) Landscape ecological balance
- (c) Biodiversity
- (d) Gene pool for restoration of biota resources
- (e) Creation of conditions for the development of interpretive tourism
- (f) Research
- (g) Promotion of nature and cultural heritage protection

There are four categories of protected area as follows:

- (a) Conservation areas  
Strict nature or cultural reserves, protected landscape features, nature or cultural reserves
- (b) Protection areas  
Protective zones for various purposes
- (c) Restoration areas  
Site where natural resources are protected or restored
- (d) Integration area  
National and regional parks, and biosphere monitoring areas

In the municipality of Birzai, there are protected areas as follows:

- (a) Birzai Regional park
- (b) Nemunelis-Apascia geological reserve
- (c) Latveliai botanical reserve
- (d) Birzai giria landscape reserve
- (e) Guodziai geomorphologic reserve

Among them, only "Birzai Regional Park" is located in, or around, the study area. The park has an area of 14,030 ha (13,694 ha in Birzai and 1,336 ha in Pusual). Zoning of the area is as follows:

- (a) Reservation area

- Landscape reserve
- Geological reserve
- Telmological reserve
- Hydrological reserve
- Botanical reserve
- Botanical-Zoological reserve

(b) Protected area

(c) Recreation area

(d) Residential area

However, according to the information from ecological staff of the municipality office, there are no reliable survey data yet concerning the fauna and flora in the park area.

Concerning the culture and heritage sites in the study area, there is no remarkable site which will be impacted by the project implementation. Although there are some monuments and old buildings/structures in, and around, the Birzai town area. It is not necessary to show them in detail as there is no such structure or place in the proposed site of STP or in the proposed route/sites of the appurtenant facilities.







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