

2.5 Present Wastewater and Solid Waste Treatment Conditions in the Mar de Dentro Area

- (1) The domestic wastewater treatment conditions in the 5 municipalities of Pelotas, Rio Grande, San Lourenco do Sul, Camaqua, and Tapes are summarized in **Table 2-2***. As of March 2000, Rio Grande is the only municipality with a sewage treatment plant (activated sludge treatment method) that treats about 8% (approximately 4,000 households) of the domestic wastewater from this municipality. At present, Pelotas is building 2 sewage treatment facilities that would adopt the anaerobic treatment method. The completion of the facility would enable the treatment of wastewater from 1/3 (24,000 households) of the entire households within the municipality.

*These five urban areas were selected as target areas for this study from the reason that population density is high and the domestic wastewater discharged from them directly influences to the water quality of coastal zone in Patos Lake.

- (2) Legally, owners of factories/enterprises are responsible for the treatment of their respective wastewater. Wastewater monitoring is not sufficiently carried out by FEPAM due to a shortage in staff. The study estimates the actual treatment ratio to be extremely low.
- (3) The solid waste management conditions in the 5 municipalities of Pelotas, Rio Grande, Sao Lourenco do Sul, Camaqua, and Tapes are summarized in **Table 2-3**. Legally, all municipalities are required to dispose their wastes by sanitary landfilling. However, Pelotas and Rio Grande still practice controlled landfilling (incomplete sanitary landfilling) where medical waste is not separately disposed from general wastes. Other municipalities only have open dumpsites.

Table 2-2 Present Condition of the Sewage and Wastewater Treatment in the Five Municipalities

	Items	Municipality				
		Pelotas	Rio Grande	S.Lourenco do Sul	Camapaqua	Tapes
1	Urban Population	291,700	175,200	23,600	42,800	12,000
	Number of House hold	About 89,000	About 48,000	About 7,700	About 14,000	About 5,500
2	Design Discharge of Drinking Water	200 L/person/day	470 L/person/day (To be confirmed)	165 L/person/day	190 L/person/day	165-190 L/person/day (Estimated)
3	Discharge of Wastewater	160 L/person/day	380 L/person/day	130 L/person/day	150 L/person/day	130-150 L/person/day
	Water quality of Wastewater	BOD:300 mg/L	BOD:300 mg/L	BOD:295 mg/L(Estimated)	BOD:300 mg/L(Estimated)	BOD:300 mg/L
	Outlet of Wastewater	Canal Sao Goncalo	Canal do Norte and Saco da Mangueira	Arroio Caraha	Sanga do Passinho Arroio Duro	Sanga das Charqueadas Sanga do Meio
4	Responsible Agency for Wastewater Treatment	SANEP	CORSAN	S.Lourenco do Sul	Camapaqua	CORSAN
5	Number of Household Connected to Sewage System	About 66,750 (75 %)	About 18,000 (37.5 %)	Not known	Not known	Not known
6	Number of Household with Septic Tank	About 1,000 (Primary treatment of night soil only and)		2,100 – 2,500 (Primary treatment of night soil and wastewater)	Not known, however the number is limited.	About 1,800
	Water Quality of Wastewater after Treatment by Septic Tank	Not known, due to lack of data.	Not known, due to lack of data.	Not known, due to lack of data.	Not known, due to lack of data	Not known, due to lack of data
7	Wastewater Treatment Method	Combined Method	Separation Method	Combined Method	Combined Method	Separation Method
8	Existing Wastewater Treatment Plant	No	Parque Marinha, constructed in 1983.	No	No	No
	Number of Household under Treatment	-	4,000 (About 8 %)	-	-	-
	Treatment Capacity	-	80 L/sec	-	-	-
	Acceptance of Wastewater from Factory	No	No	No	No	No
	Wastewater Quality before Treatment	-	BOD: 300 mg/L	-	-	-
	Treatment Method	-^	Activated Sludge Method	-	-	-
	Wastewater Quality after Treatment	-	BOD:30 mg/L	-	-	-
	Outlet	-	Saco da Mangueira	-	-	-
	Treatment of Sludge	-	Dumping on the Ground	-	-	-
9	Treatment of Wastewater from Factory					
	Kinds of Factories	Leather, Soya Been Oil, Canning, Oil Refinery	Soya Been Oil, Canning, Oil Refinery, Fish Processing	Rice Processing, Leather	Rice Processing, Fish Processing	Rice Processing, Leather
	Treatment Condition	Oil refinery factory has chemical waste treatment. However, others are not known.	Oil refinery factory has chemical waste treatment. However, others are not known.	Not known	Not known	Not known
	Supervising Agency	SANEP, FEPAM	FEPAM	FEPAM	FEPAM and Municipality	FEPAM

Table 2-3 Conditions of the Solid Waste Disposal Sites in the Five Municipalities

	Items	Municipality				
		Pelotas	Rio Grande	S. Lourenço do Sul	Tapes	Camaquã
1	Type of disposal site	Controlled landfill <ul style="list-style-type: none"> Daily coverage with earth Drainage for leachate Drainage for gases Compacted turf as bottom liner (40 cm) 	Controlled landfill <ul style="list-style-type: none"> Daily coverage with earth only. No drainage for leachate nor gases. No bottom liner 	Open dumping (“Lixão”) <ul style="list-style-type: none"> No protection measures against contamination 	Open dumping (“Lixão”) <ul style="list-style-type: none"> No protection measures against contamination 	Open dumping (“Lixão”) <ul style="list-style-type: none"> No protection measures against contamination
2	Present Status	Closure process A temporary sanitary landfill is planned to be installed at a nearby site on an emergency basis until the definite site of the sanitary landfill is approved by FEPAM. The area belongs to the local government and the operation shall be carried out by a contracted company (now in bidding process). This landfill shall not be licensed by FEPAM because of its location. The same contract shall foresee the reclamation of the “Controlled Landfill” (4.5 ha) now in closure process.	In use The local government is being sued in order to carry out measures for the environmental reclamation of the area.	In use The local government is being sued in order to carry out measures for the environmental reclamation of the area.	In use The local government is being sued in order to carry out measures for the environmental reclamation of the area.	In use The local government is being sued in order to carry out measures for the environmental reclamation of the area.
3	Time of utilization	More than 17 years	More than 20 years	More than 20 years	Approximately 7 years	More than 10 years
4	Area	3 ha (already closed) 1.5 ha (closure process) 11 ha (temporary sanitary landfill)	14 ha (already closed) 9 ha (in utilization)	approx. 2 ha (no compaction scattered)	approx. 3 ha (no compaction, scattered)	approx. 3ha (no compaction, scattered)
5	Height	4 to 5 m at the closure of the landfill.	6 m (closed area) 4 m (in utilization)	Approx. 3 to 4 meters (not even)	No estimation	Approx. 3 to 4 meters (not even)
6	Disposal Volume	150 ton/day	100 ton/day	10 ~ 11 ton/day 14 ton/day (Dec to March)	7 ton/day 10 ton/day (Dec to March)	25 ton/day
7	Location of the disposal site	Within the urban zone	Within the urban zone	Approx. 2 km from the urban perimeter	Approx. 6 km from the urban perimeter	Within the urban zone
8	Distance from Patos Lake in a straight line	Approx. 11.4 km	Less than 60 cm	Approx. 3 km	Approx. 4 km	Approx. 40 km

Table 2-3 Conditions of the Solid Waste Disposal Sites in the Five Municipalities (continuation)

	Item	Municipalities				
		Pelotas	Rio Grande	S. Lourenço do Sul	Tapes	Camaquã
9	Distance from nearby water stream	1.0 km from Santa Bárbara Canal 3.6 km from São Gonçalo Canal Beside the Matadouro Brook	-	Arroio Carahá (Carahá brook) is just beside the dumping site	4.5 km from Teixeira Brook	1.2 km from Sanga do Passinho (Passinho brook)
10	Drainage and treatment of leachate	Drainage and treatment in stabilization ponds (4 in a sequence). The Matadouro Brook (Sanga do Matadouro) is the recipient water body after the treatment in the stabilization ponds. The leachate is analyzed in a monthly basis by SANEP.	NO	NO	NO	NO
11	Co-disposal of Medical Service Solid Waste	YES The collected medical services solid waste is disposed in ditches lined with plastic sheet and covered with lime.	YES They received the LP and LI for the installation of an Autoclave at the dumping site to sterilize waste from medical services. After sterilization, the waste shall be disposed together with domestic solid waste.	NO The medical services solid waste is collected, transported and incinerated by a private company in another city.	NO The medical services solid waste is incinerated in the local hospital. This waste comes from some pharmacies, and 2 health posts (municipal and state).	NO The medical services solid waste is collected, transported and incinerated by a private company in another city.
12	Presence of scavengers at the site	NO	YES (several)	YES (several)	YES (several)	YES (several)
13	Licensing Procedures at FEPAM (Installation of a Sanitary Landfill)	The EIA-RIMA (Report on Environmental Impact) was elaborated. However FEPAM requested further information to complement the analysis. The Pelotas officials are organizing the necessary further information.	The EIA-RIMA (Study and Report on Environmental Impact) was elaborated. However FEPAM requested further information to complement the analysis. If the Rio Grande officials do not respond the request in time, the licensing process shall be interrupted.	The LP shall be granted to an area owned by a private company who intends to operate the Domestic Solid Waste management system (collection, transportation, and final disposal). At present, in bidding process.	According to the FEPAM responsible official, there is no licensing process for a new sanitary landfill being analyzed by that institution. However, the Tapes local government officials declared they have already started the submission process at FEPAM, presenting three alternative areas for the new sanitary landfill location. Both information are incompatible.	The area for the new sanitary landfill already received a LP (Previous License) by FEPAM. The local officials shall submit a detailed design of the sanitary landfill to obtain the LI (Installation License). The area is already being purchased by the local government.