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Appropriate technology options for managing drainage flows from low cost peri urban settlements in South Africa.

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INDIVIDUAL HOUSEHOLD - AVERAGE DAILY CONSUMPTION PER WATER USE

	Amount in liters			%age of average daily consumption			
Water use	**House hold -3**	**Household -2**	**Household -1**	**House hold -3**	**Household -2**	**Household -1**	**Average**
cooking	10.4	10.333	14.167	6	7	10	7.675
laundry	28	26.167	23.000	16	19	16	16.785
kitchen	11.04	8.750	9.500	6	6	7	6.356
drinking	1.148	1.047	1.200	1	1	1	0.741
personal hygiene	24.028	21.633	36.333	14	15	25	18.034
toilet	93	80.000	57.500	53	57	40	49.771
car washing	8	0.000	0.000	5	0	0	1.518
Other (controlling dust)	0	0.833	2.500	0	1	2	0.773

Wastewater stream	**% amount**
sewage	58.2
sullage	41
other	2

White South African households (Morris, 1971)

	%age of mean daily per capita consumption
cooking	2
Washing (clothes, dishes, and other)	18
personal hygiene	24
General cleaning	3
toilet	27
Physiological needs	1
recreation + gardening	25

Western style households - Canada, US and Sweden

	mean %age volume used
kitchen	9
Bathroom	26
laundry	18
toilet flushing	47

rural households- Lesotho

	%age of mean daily per capita consumption
Kitchen water (cooking, dish washing, drinking water	45.3
personal hygiene (Bathroom)	15
Clothes washing	22
Other (un-specified)	9.7
Domestic animals	2.4
gardening (vegetable)	5.6

Alexandra west bank shacks	**Mean %age per capita consumption**
Kitchen water (cooking, dish washing, drinking water	15
laundry	17.03
Personal hygiene	18.06
toilet	51.3
car washing	1.6
Other	0.59

INDIVIDUAL HOUSEHOLD WATER CONSUMPTION AND WASTE WATER DISPOSAL IN ALEXANDRA WEST BANK-household 3

HHLD	DATE	TIME OF DAY	NO. OF	QUANTITIES CONSUMED IN LITRES AND PURPOSES FOR USE								Total	mean,	WWATER	WW as %ge
UNIT			OCCUPANTS	Cooking	laundry	kitchen	drinking	personal	toilet	car-wash	other	in litres	l/c/d	disposed	
	19/04/04	6:00-6:30 am	4	0	0	0	0	3.3	0	0	0	3.3			
		6:30-7:30 am	3	1	0	0.9	0	3.3	15	0	0	20.2			
		7:30-8:00 am	2	1	0	1	0	3.3	0	0	0	5.3			
		9:30-10:00 am	0	0	0	0	0	0	0	0	0	0			
HOUSE		10:00-12:00 am	1	1	60	10	0.6	6	15	0	0	92.6			
HOLD		12:00-14:00 pm	1	3	0	1	0.3	0	0	0	0	4.3			
UNIT -1		14:00-17:00 pm	3	0	0	0	0	0	30	40	0	70			
		17:00-19:30 pm	4	5	0	5	1.2	0	15	0	0	26.2			
		19:30-20:00 pm	4	0	0	0	0.6	0	15	0	0	15.6			
				11	60	17.9	2.7	15.9	90	40		237.5	59.375	223.8	94.23
	20/04/04	6:00-6:30 am	4	0	0	0	0	3.3	0	0	0	3.3			
		6:30-7:30 am	3	1	0	1.5	0	3.3	0	0	0	5.8			
		7:30-8:00 am	2	1	0	0	0.34	3.8	0	0	0	5.14			
		9:30-10:00 am	2	0	0	0	0	0	15	0	0	15			
		10:00-11:30 am	1	1	0	2	0.3	5.34	0	0	0	8.64			
		11:30-13:00 am/pm	1	0	0	0	0	0	0	0	0	0			
		13:00-15:00 pm	3	0	60	0	0	8	45	0	0	113			
		15:00-17:00 pm	3	2	0	3	0.6	2	0	0	0	7.6			
		17:00-20:00 pm	4	4	0	2	0.6	3	0	0	0	9.6			
		20:00-21:00 pm	4	0	0	0	0	0	15	0	0	15			
				9	60	8.5	1.84	28.74	75	0		183.08	45.77	172.24	94.08
		6:15-6:40 am	4	0	0	0	0	2	0	0	0	2			
		6:40-7:30 am	3	1	0	1	0	3	15	0	0	20			
	21/04/04	7:30-8:00 am	2	0	0	1	0	3	0	0	0	4			
		10:00-11:00 am	2	0	0	0	0	0	15	0	0	15			
		11:00-13:00 am/pm	1	2	10	4	0	5	0	0	0	21			
		13:00-17:00 pm	3	0	0	0	0	1	15	0	0	16			
		17:00-19:30 pm	4	6	0	5	0	2	30	0	0	43			
		19:30-21:30 pm	4	0	0	0	0	3	30	0	0	33			
				9	10	11	0	19	105	0	0	154	38.5	145	94.16
	22/04/04	5:50-6:30 am	4	1	0	0.5	0	3.3	15	0	0	19.8			
		6:30-7:30 am	3	1	0	1	0	3.3	0	0	0	5.3			
		7:30-8:00 am	2	1	0	2	0	8	15	0	0	26			
		8:00-13:00 am/pm	0	0	0	0	0	5	30	0	0	35			
		13:00-17:00 pm	3	0	0	0	0	1	0	0	0	1			
		17:00-20:00 pm	4	6	0	0	0	2	0	0	0	8			
		21:00-22:00	4	0	0	0	0	3	30	0	0	33			
				9	0	3.5	0	25.6	90	0	0	128.1	32.025	119.1	92.97
	23/04/04	6:15-6:30 am	4	2	0	1	0	2	0	0	0	5			
		6:30-7:45 am	3	1	0	0.5	0	3	15	0	0	19.5			
		7:45-8:30 am	2	2	0	1	0	2	15	0	0	20			
		11:30-14:00 am/pm	1	0	10	2	0.3	6	15	0	0	33.3			
		14:00-17:00 pm	3	3	0	3	0.6	0	30	0	0	36.6			
		17:00-19:45 pm	4	6	0	3	0.3	2	15	0	0	26.3			
		19:45-20:30 pm	4	0	0	4	0	15.9	15	0	0	34.9			
				14	10	14.5	1.2	30.9	105	0	0	175.6	43.9	160.4	91.34
	24/04/04		**OCCUPANTS**	**OUT**	**FOR**	**THE**	**WEEKEND**								
	totals											**878.28**		**820.54**	**93.4**
												175.656		**164.108**	
												43.914		**41.027**	

INDIVIDUAL HOUSEHOLD WATER CONSUMPTION AND WASTE WATER DISPOSAL IN ALEXANDRA WEST BANK-household 1

HHLD UNIT	DATE	TIME OF DAY	NO. OF OCCUPANTS	QUANTITIES CONSUMED IN LITRES AND PURPOSES FOR USE								Total in litres	wastewater disposed disposed	WW as a %ge
				Cooking	laundry	kitchen	drinking	personal	toilet	car-wash	other			
	19/04/04	5:00-7:00 AM	**6**	4	0	2	0	24	15	0	0	45		
		11:00-13:00 AM/PM	**3**	4	0	3	0.6	8	0	0	1	16.6		
		13:00-17:00 PM	**3**	0	0	0	0	0	0	0	0	0		
		17:00-18:00 PM	**6**	6	0	3	0.9	10	15	0	0	34.9		
		18:00-20:30 PM	**6**	2	0	1	0	0	15	0	0	18		
				16	0	9	1.5	42	45	0	1	114.5	97	84.72
	20/04/04	5:30-7:00 AM	**6**	3	0	1	0	20	0	0	2	26		
		10:45-13:30 AM/PM	**3**	5	15	4	0.6	25	15	0	2	66.6		
		13:30-17:00 PM	**3**	0	0	0	0.3	0	15	0	0	15.3		
		17:00-19:30 PM	**6**	6	0	3	0.6	0	15	0	0	24.6		
		19:30-21:00 PM	**6**	0	0	0	0	0	30	0	0	30		
HOUSE				14	15	8	1.5	45	75	0	4	162.5	147	90.46
HOLD	21/04/04	5:00-7:00 AM	**6**	3	0	2	0	18	15	0	0	38		
UNIT - 3		10:45-14:00 AM/PM	**3**	5	60	5	0.6	10	0	0	0	80.6		
		14:30 -17:00 PM	**3**	0	0	0	0	0	30	0	0	30		
		17:00-19:00 PM	**6**	4	0	5	0	0	15	0	0	24		
				12	60	12	0.6	28	60	0	0	172.6	160	92.70
	22/04/04	6:00-7:00 AM	**6**	4	0	2	0.9	15	15	0	2	38.9		
		11:00-14:30 AM/PM	**3**	3	10	3	0.6	16	0	0	0	32.6		
		14:30-17:00 PM	**3**	0	0	0	0	0	0	0	0	0		
		17:00-19:00 PM	**6**	5	5	4	0.3	0	0	0	0	14.3		
		19:00-20:00 PM	**6**	2	0	1	0	0	15	0	0	18		
				14	15	10	1.8	31	30	0	2	103.8	88	84.78
	23/04/04	5:30-7:00 AM	**6**	4	0	2	0	15	15	0	2	38		
		10:30-15:00 AM/PM	**4**	3	30	4	0	14	15	0	0	66		
		17:00-19:00 PM	**7**	7	0	4	0.9	0	15	0	0	26.9		
		19:00-21:00 PM	**7**	4	0	2	0	10	30	0	0	46		
				18	30	12	0.9	39	75	0	2	176.9	158	89.32
	24/04/04	9:00-11:30 AM	**7**	4	18	3	0.6	36	15	0	6	82.6		
		11:30-18:00 AM/PM	**5**	3	0	2	0.3	0	15	0	0	20.3		
		18:00-21:00 PM	**7**	4	0	1	0	0	30	0	0	35		
				11	18	6	0.9	36	60	0	6	137.9	126	91.37
TOTALS												**868.2**	**776**	**89.38**
												144.7	**129.33**	
												24.12	**21.56**	

INDIVIDUAL HOUSEHOLD WATER CONSUMPTION AND WASTE WATER DISPOSAL IN ALEXANDRA WEST BANK-household 2

HHLD UNIT	DATE	TIME OF DAY	NO. OF OCCUPANTS	QUANTITIES CONSUMED IN LITRES AND PURPOSES FOR USE								Total in litres	wastewater disposed	WW as %ge
				Cooking	laundry	kitchen	drinking	personal	toilet	car-wash	other			
	19/04/04	7:00 -8:00 AM	**3**	4	0	2	0.6	5.9	45	0	0	57.5		
		8:00 - 17:00 AM/PM	**0**	0	0	0	0	0	0	0	0	0		
		17:00 - 19:00 PM	**3**	6	15	4	0	15	15	0	0	55		
		19:00 - 20:30 PM	**3**	2	0	1	0	0	30	0	0	33		
				12	15	7	0.6	20.9	90	0	0	145.5	132.9	91.34
		6:00-7:00 AM	**3**	0	0	0	0	0	15	0	0	15		
	20/04/04	7:00 -8:00 AM	**3**	3	0	1.5	0	6.9	0	0	0	11.4		
		8:00 - 17:00 AM/PM	**0**	0	0	0	0	0	15	0	0	15		
HOUSE		17:00 - 19:00 PM	**3**	6	0	4	0	15	0	0	5	30		
HOLD -		19:00-20:00 PM	**3**	2	0	0	0.3	0	0	0	0	2.3		
		20:00-21:00 PM		0	0	0	0	0	30	0	0	30		
UNIT 2				11	0	5.5	0.3	21.9	60	0	5	88.7	77.4	87.26
		6:30-7:00 AM	**3**	0	0	0	0	0	15	0	0	15		
	21/04/04	7:00 -8:00 AM	**3**	3	0	3	0	0	15	0	0	21		
		8:00 - 17:00 AM/PM	**0**	0	0	0	0	2	15	0	0	17		
		17:00 - 19:00 PM	**3**	6	0	4	0.9	0	15	0	0	25.9		
		19:00-20:00 PM	**3**	3	0	5	0	15	30	0	0	53		
				12	0	12	0.9	17	90	0	0	116.9	104	88.96
	22/04/04	6:30 -8:00 AM	**3**	4	0	3	0	5	30	0	0	42		
		8:00 - 17:00 AM/PM	**3**	0	0	0	0	0	15	0	0	15		
		17:00 - 19:30 PM	**3**	4	10	4	0.9	1	15	0	0	34.9		
		19:00-20:30 PM	**3**	2	0	5	0	13	15	0	0	35		
				10	10	12	0.9	19	75	0	0	126.9	116	91.41
		6:00-7:45 AM	**3**	0	0	0	0	0	15	0	0	15		
	23/04/04	7:45-8:15 AM	**3**	0	0	0	0	3.9	0	0	0	3.9		
		8:15-17:00 AM/PM	**0**	0	0	0	0	0	45	0	0	45		
		17:00-20:00 PM	**3**	4	0	5	0.9	2	0	0	0	11.9		
		20:00-24:00 PM/AM	**3**	0	7	0	0	13	15	0	0	35		
				4	7	5	0.9	18.9	75	0	0	95.8	90.9	94.89
	24/04/04	6:00-8:00 AM	**3**	3	0	2	0	4	15	0	0	24		
		8:00-10:00 AM	**1**	0	100	0	0	2	15	0	0	117		
		10:00-12:00 AM	**1**	2	25	4	1.02	10	0	0	0	42.02		
		12:00-15:00 PM	**1**	0	0	0	0	0	15	0	0	15		
		15:00-17:00 PM	**3**	2	0	1	0	1.1	0	0	0	4.1		
		17:00-19:30 PM	**3**	6	0	4	1.36	15	30	0	0	56.36		
		19:30-00:45 PM/AM	**3**	0	0	0	0.3	0	15	0	0	15.3		
				13	125	11	2.68	32.1	90	0	0	273.78	258.1	94.27
		TOTALS										**847.58**	**709.4**	**83.70**
												141.26	**118.23**	
												47.09	**39.41**	