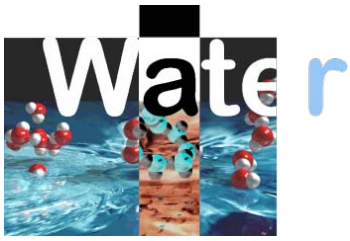

Strengthening the Scientific Foundation of Water Quality Programs

Project Number: **LIFE08 ENV /CY / 000460**

Deliverable Number: D2.3 and D4.2

Deliverable Name: Emission Rates and Emissions data/register

Authors**: Charalambos Panayiotou** (ACC), **Athena Papanastasiou** (DOE), **Andreas Antoniou** (DOE)

Dissemination Level		
PU	**Public**	**X**
PP	**Restricted to other program participants (including the Commission Services)**	
CO	**Confidential, only for members of the Consortium (including Commission Services)**	

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- Activities which have given publicity to the project; like seminars, newspaper (local, popular, national) articles, scientific articles, presentations, radio and TV broadcasts. Remember that an overall objective of the LIFE programme is demonstration, i.e. informing about the project and its results so that others can benefit from the experience gained with EU support. Consider that all dissemination material (Website, brochures, reports, slides, leaflets, etc.) must include an acknowledgement of LIFE financing and the LIFE logo.

1. Drafting of a pollutant Register for Kalo Horio catchment

1.1 Identification of point sources

Point sources in the Kalo Horio catchment have been identified through a search of permitted sites under the Effluent Consent or IPPC regulations and through the PRTR registry. In addition, field visits were made in order to identify potential point sources that are not currently registered under any of the above-mentioned regulations. A total of sixty six installations were identified that can potentially constitute a source of pollutant loads to the salt lake (Table 1). Most of these are industrial units which are located in one of the two Industrial zones that are located in the Kalo Horio river basin.

PRTR installations have been identified through a register managed by DoE. As foreseen in the project proposal, PRTR installations in all of Cyprus were incorporated in the models. A total of 65 installations were identified based on the 2009 Yearly PRTR Cyprus Report. Each establishment and its parameters relevant to water quality impacts or management have been incorporated in the BASINS database. Data include basic information of the site as well as geographic location, type and size of the facility and pollutant release rates.

Table 1. List of identified point sources in the Kalo Horio river basin

A/A	Facility Name	NACE code	Easting	Northing
1	K.Kythreotis Holdings Public Ltd	8.11	513805.22	3849599.30
2	Mosfiloti Quarries ltd	8.11	540310.72	3867931.03
3	Skyra Lima Public	8.11	538469.90	3862744.16
4	Skyramont Quarries Ltd	8.11	514309.15	3849112.14
5	Poullas Tsadiotis Ltd	8.11	444526.07	3872934.61
6	Electricity Authority of Cyprus, Moni Power station	35.11	516711.98	3840899.09
7	Electricity Authority of Cyprus, Dhekelia Power Station	35.11	568112.38	3871095.30
8	Muskita Aluminium Industries Plc	25.61	499596.89	3836470.50
9	Vassiliko Cement works public company ltd, Moni Plant	23.51	517525.82	3840931.32
10	Sewerage Board of Limassol - Amathus	37	519532.09	3841059.89
11	Electricity Authority of Cyprus, Vassilikos Power Station	35.11	526527.53	3842970.20
12	Kofinou Slaughterhouse	10.11	537900.40	3856864.24
13	Hellenic Cooper Mines Ltd	24.44	490354.39	3882820.98
14	Vassiliko Cement works public company ltd, Vassilikos Plant	23.51	528968.40	3842223.15
15	Andreas Neophytou Andronikou and Sons Ltd	1.46	522977.00	3890062.37
16	Marcos Nicolaou	1.46	554438.11	3871149.61
17	Hellas Farm Ltd	1.46	538463.49	3881397.35
18	Kyriakos Tsingis Chirotrophiki Ltd	1.46	513104.81	3890518.92
19	panagiotis Hadjikyriakos & Sons Farm Ltd	1.46	508001.31	3879280.20
20	Loizos Constantinou Farm ltd	1.46	507847.91	3884474.96
21	Antoniades M. Farm Ltd	1.46	511907.33	3883515.23
22	Gyros Farm Ltd	1.46	509112.57	3885888.54
23	K.D.E Koumantari	1.46	554440.04	3870320.85
24	Michalakis Farm Ltd	1.46	515027.54	3883363.04
25	S.P Lagos Farm	1.46	538832.16	3881169.46
26	A/phi Teloni Chirotrophi Ltd	1.46	554423.76	3870463.82

27	Christakis Neophytou & Sons Ltd	1.46	522972.10	3889912.8.6
28	Farm Georgios Neophytou Ltd	1.46	522908.10	3889503.03
29	P.G.P Meat Traders Ltd	1.46	520860.23	3888488.90
30	Animalia Genetics Ltd	1.46	528945.57	3874368.34
31	The Concorde Piggery Farm Ltd	1.46	509847.99	3884322.87
32	D&F Afxentiou Bros Ltd	1.46	534060.38	3847692.89
33	Phillipos Panagiotou Ltd	1.46	509694.68	3885616.56
34	L.A Top Genetics Ltd	1.46	528898.34	3873523.81
35	Andreou Brothers Pigfarms Ltd (Tersefanou Farm)	1.46	548682.22	3856168.38
36	Andreou Brothers Pigfarms Ltd (Xylotympou Farm)	1.46	567192.86	3877326.36
37	Andreas Kailas & Sons Ltd	1.46	549522.07	3877976.52
38	Ioannis Georgiou Piggery Ltd	1.46	508915.10	3880409.65
39	Georgios Pantziaros Farming Company Ltd	1.46	547015.85	3878421.70
40	Nicos Armenis & Sons Ltd	1.46	519?93.20	3846448.5.3
41	Nicos Pimbos Ltd	1.46	508005.64	3882751.63
42	K.K.E. Piggery Farm Ltd (B)	1.46	510639.73	3885165.15
43	K.K.E. Piggery Farm Ltd (A)	1.46	512742.00	3889326.23
44	Ch. Nikodimou&Sia Ltd	1.46	508046.59	3879111.79
45	Kousparou Bros Ltd	1.46	496878.33	3882481.27
46	A. Hadjimarkou & Sons Ltd	1.46	511545.85	3883000.30
47	Lazy Pig Farm Ltd	1.46	554098.31	3870776.62
48	Kypros Antoniou Farm Ltd	1.46	509593.73	3885339.20
49	Mintikkis Chicken Farm Ltd	1.47	517951.23	3883318.78
50	Andreou Brother Pigfarms Ltd (Marathosfarm)	1.46	452482.51	3848087.17
51	Navarro Farms Ltd	1.47	529677.40	3874569.98
52	Pipis Bros Farm P. Company (A)	1.47	517151.02	3891418.97
53	Pipis Bros Farm P. Company (B)	1.47	516392.60	3891171.15
54	Pipis Bros Farm P. Company (C)	1.47	515959.60	3892803.04
55	Pipis Bros Farm P. Company (D)	1.47	515910.74	3891848.00
56	Pipis Bros Farm P. Company (F)	1.47	515226.63	3892524.53
57	Pipis Bros Farm P. Company (A)	1.47	515197.20	3891995.27
58	Tzionis Farm Ltd	1.47	549881.78	3877512.70
59	Mintikkis&Nicolaides Bros Ltd	1.47	526744.42	3880325.17
60	A. Mintikkis Farm Ltd	1.47	528969.61	3873982.38
61	Pipis Bros Farm Public Company Ltd (Peristerona)	1.47	508959.41	3886878.83
62	G. Georgiou Chickens Farm Ltd (FARM A+B)	1.47	518645.62	3847321.57
63	Paradisiotis Ektrofi Ltd	1.47	505611.58	3885664.24
64	A. Mintikkis Farm Ltd	1.47	528652.15	3873872.92
65	Sigan Management Ltd-Rendering Plant	38.22	538010.06	3856875.79
66	Ecofuel (Cyprus) Ltd	38.22	528709.85	3842040.03

Table 2: PRTR Installations for Cyprus (2009)

A/A	Facility Name	NACE Code	Salinity/ EC	F-coli	Suspended solids	BODmg/l	Hg and Compounds (kg)	No and Compounds (kg)	DO	Nutrients						Easting	Northing
										CD (kg)	Cu and compounds (kg)	Νιτρικά mg/l	Νιτρώδη mg/l	Total N mg/l	Αμμωνιακά	Φωσφορικά mg/l		
1	K.Kythreotis Holdings Public Ltd	8.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	513805.22	3849599.30
2	Mosfiloti Quarries ltd	8.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	540310.72	3867931.03
3	Skyra Lima Public	8.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	538469.90	3862744.16
4	Skyramont Quarries Ltd	8.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	514309.15	3849112.14
5	Poullas Tsadiotis Ltd	8.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	444526.07	3872934.61
6	Electricity Authority of Cyprus, Moni Power station	35.11	0	0	0	0	0	0	0	0	59.1	0	0	0	0	0	516711.98	3840899.09
7	Electricity Authority of Cyprus, Dhekelia Power Station	35.11	0	0	0	0	1.2	25.8	0	7.59	0	0	0	0	0	5170 kg	568112.38	3871095.30
8	Muskita Aluminium Industries Plc	25.61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	499596.89	3836470.50
9	Vassiliko Cement works public company ltd, Moni Plant	23.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	517525.82	3840931.32
10	Sewerage Board of Limassol - Amathus	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	519532.09	3841059.89
11	Electricity Authority of Cyprus, Vassilikos Power Station	35.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	526527.53	3842970.20
12	Kofinou Slaughterhouse	10.11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	537900.40	3856864.24
13	Hellenic Cooper Mines Ltd	24.44	0	0	0	0	0	0	0	0	0	0	0	0	0	0	490354.39	3882820.98
14	Vassiliko Cement works public company ltd, Vassilikos Plant	23.51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528968.40	3842223.15
15	Andreas Neophytou Andronikou and Sons Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	522977.00	3890062.37
16	Marcos Nicolaou	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	554438.11	3871149.61

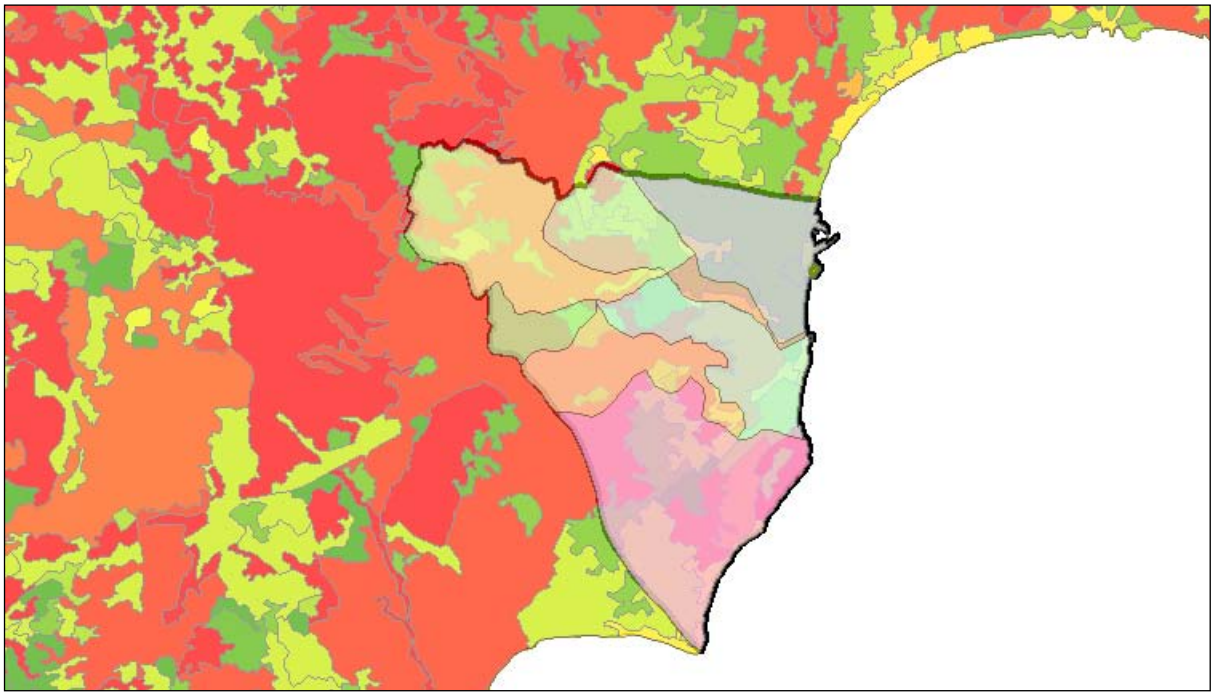
17	Hellas Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	538463.49	3881397.35
18	Kyriakos Tsingis Chirotrophiki Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	513104.81	3890518.92
19	panagiotis Hadjikyriakos & Sons Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	508001.31	3879280.20
20	Loizos Constantinou Farm ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	507847.91	3884474.96
21	Antoniades M. Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	511907.33	3883515.23
22	Gyros Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509112.57	3885888.54
23	K.D.E Koumantari	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	554440.04	3870320.85
24	Michalakis Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515027.54	3883363.04
25	S.P Lagos Farm	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	538832.16	3881169.46
26	A/phi Teloni Chirotrophi Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	554423.76	3870463.82
27	Christakis Neophytou & Sons Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	522972.10	3889912.8.6
28	Farm Georgios Neophytou Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	522908.10	3889503.03
29	P.G.P Meat Traders Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	520860.23	3888488.90
30	Animalia Genetics Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528945.57	3874368.34
31	The Concorde Piggery Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509847.99	3884322.87
32	D&F Afxentiou Bros Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	534060.38	3847692.89
33	Phillipos Panagiotou Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509694.68	3885616.56
34	L.A Top Genetics Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528898.34	3873523.81
35	Andreou Brothers Pigfarms Ltd (Tersefanou Farm)	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	548682.22	3856168.38
36	Andreou Brothers Pigfarms Ltd (Xylotympou Farm)	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	567192.86	3877326.36
37	Andreas Kailas & Sons Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	549522.07	3877976.52
38	Ioannis Georgiou Piggery Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	508915.10	3880409.65
39	Georgios Pantziaros Farming Company Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	547015.85	3878421.70
40	Nicos Armenis & Sons Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	519?93.20	3846448.5.3
41	Nicos Pimbos Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	508005.64	3882751.63

42	K.K.E. Piggery Farm Ltd (B)	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	510639.73	3885165.15
43	K.K.E. Piggery Farm Ltd (A)	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	512742.00	3889326.23
44	Ch. Nikodimou&Sia Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	508046.59	3879111.79
45	Kousparou Bros Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	496878.33	3882481.27
46	A. Hadjimarkou & Sons Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	511545.85	3883000.30
47	Lazy Pig Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	554098.31	3870776.62
48	Kypros Antoniou Farm Ltd	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	509593.73	3885339.20
49	Mintikkis Chicken Farm Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	517951.23	3883318.78
50	Andreou Brother Pigfarms Ltd (Marathosfarm)	1.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	452482.51	3848087.17
51	Navarro Farms Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	529677.40	3874569.98
52	Pipis Bros Farm P. Company (A)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	517151.02	3891418.97
53	Pipis Bros Farm P. Company (B)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	516392.60	3891171.15
54	Pipis Bros Farm P. Company (C)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515959.60	3892803.04
55	Pipis Bros Farm P. Company (D)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515910.74	3891848.00
56	Pipis Bros Farm P. Company (F)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515226.63	3892524.53
57	Pipis Bros Farm P. Company (A)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	515197.20	3891995.27
58	Tzionis Farm Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	549881.78	3877512.70
59	Mintikkis&Nicolaides Bros Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	526744.42	3880325.17
60	A. Mintikkis Farm Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528969.61	3873982.38
61	Pipis Bros Farm Public Company Ltd (Peristerona)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	508959.41	3886878.83
62	G. Georgiou Chickens Farm Ltd (FARM A+B)	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	518645.62	3847321.57
63	Paradisiotis Ektrofi Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	505611.58	3885664.24
64	A. Mintikkis Farm Ltd	1.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528652.15	3873872.92
65	Sigan Management Ltd-Rendering Plant	38.22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	538010.06	3856875.79
66	Ecofuel (Cyprus) Ltd	38.22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	528709.85	3842040.03

1.2 Identification of non-point sources

Non-point sources are made of small effluents that are dispersed over large areas. In addition, these effluents exhibit a large temporal variability. It is therefore not practical to monitor these effluent rates. For the Larnaca Salt Lake Non point sources have been identified through the Corine 2005 land use map (Map 1). The identified land use types identified within the Kalo Horio subcatchment are shown on Table 3.

Map 1: Land uses within the Kalo Horio subcatchment



Note: The Shaded areas depict the hydrological sub-basins of the Kalo Horio river basin.

Septic tanks are still used in a large part of the Kalo Horio ctahment. The effluent from a well-functioning septic tank is comparable to secondarily treated wastewater from a sewage treatment plant and may be considered to be small sources of pollutant loads to the salt lake. Mul-functioning systems can, however, be a significant source of nitrogen, phosphorus and pathogens. In addition, leaks from the sewerage collection network can also contribute to groundwater and surface water pollution. For the purposes of this study, it was assumed that these systems have a10% failure rate.

Table 3: Land Uses within the Kalo Horio Subcatchment

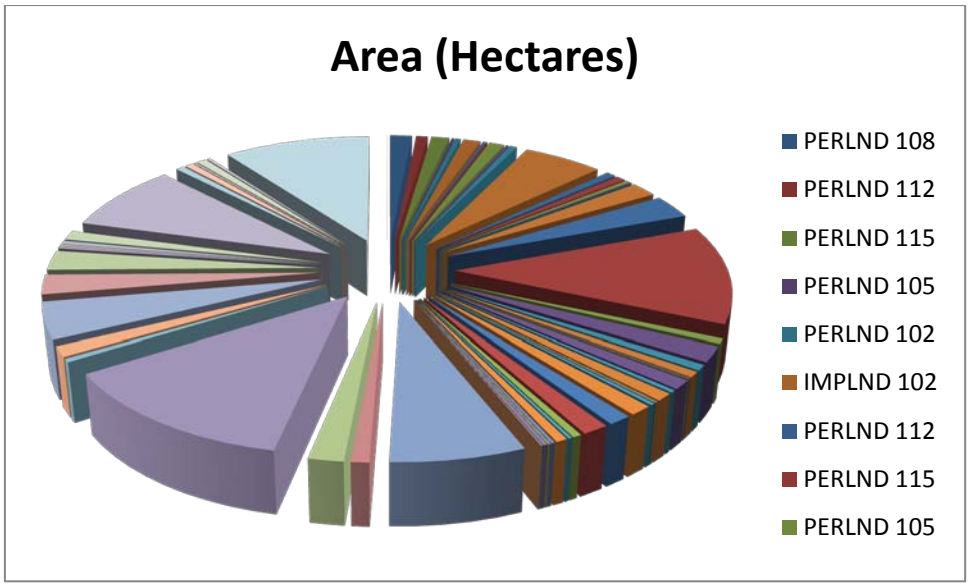
Source ID	Source Description	Target ID	Area (Hectares)
PERLND 108	Sclerophylous vegeta	RCHRES 1	188.5
PERLND 112	Land principally occ	RCHRES 1	99.5
PERLND 115	Complex cultivation	RCHRES 1	155.1
PERLND 105	Non-irrigated arable	RCHRES 1	18.6
PERLND 102	Industrial or commer	RCHRES 2	49.9
IMPLND 102	Industrial or commer	RCHRES 2	149.7
PERLND 112	Land principally occ	RCHRES 2	26
PERLND 115	Complex cultivation	RCHRES 2	8.7
PERLND 105	Non-irrigated arable	RCHRES 2	131.3
PERLND 102	Industrial or commer	RCHRES 9	21.3
IMPLND 102	Industrial or commer	RCHRES 9	63.9
PERLND 105	Non-irrigated arable	RCHRES 9	687.2
PERLND 110	Discontinuous urban	RCHRES 10	84.7
IMPLND 110	Discontinuous urban	RCHRES 10	84.7
PERLND 103	Green urban areas	RCHRES 10	41.3
IMPLND 103	Green urban areas	RCHRES 10	13.8
PERLND 104	Salt marshes	RCHRES 10	0
PERLND 115	Complex cultivation	RCHRES 10	228.1
PERLND 105	Non-irrigated arable	RCHRES 10	363.8
PERLND 105	Non-irrigated arable	RCHRES 5	1511.2
PERLND 102	Industrial or commer	RCHRES 8	77.8
IMPLND 102	Industrial or commer	RCHRES 8	233.3
PERLND 110	Discontinuous urban	RCHRES 8	84.7
IMPLND 110	Discontinuous urban	RCHRES 8	84.7
PERLND 103	Green urban areas	RCHRES 8	13.6
IMPLND 103	Green urban areas	RCHRES 8	4.5
PERLND 104	Salt marshes	RCHRES 8	0.8
PERLND 115	Complex cultivation	RCHRES 8	134
PERLND 102	Industrial or commer	RCHRES 11	37.8
IMPLND 102	Industrial or commer	RCHRES 11	113.5
PERLND 110	Discontinuous urban	RCHRES 11	0.9
IMPLND 110	Discontinuous urban	RCHRES 11	0.9
PERLND 115	Complex cultivation	RCHRES 11	13.8
PERLND 102	Industrial or commer	RCHRES 4	10.1
IMPLND 102	Industrial or commer	RCHRES 4	30.3
PERLND 110	Discontinuous urban	RCHRES 4	147.2
IMPLND 110	Discontinuous urban	RCHRES 4	147.2
PERLND 103	Green urban areas	RCHRES 4	166.8
IMPLND 103	Green urban areas	RCHRES 4	55.6
PERLND 104	Salt marshes	RCHRES 4	0
PERLND 113	Continuous Urban Fab	RCHRES 4	24.4
IMPLND 113	Continuous Urban Fab	RCHRES 4	73.2

PERLND 114	Sport and leisure fa	RCHRES 4	25.7
IMPLND 114	Sport and leisure fa	RCHRES 4	2.9
PERLND 102	Industrial or commer	RCHRES 3	10.3
IMPLND 102	Industrial or commer	RCHRES 3	30.9
PERLND 110	Discontinuous urban	RCHRES 3	4.3
IMPLND 110	Discontinuous urban	RCHRES 3	4.3
PERLND 105	Non-irrigated arable	RCHRES 3	841.6
PERLND 106	Transitional woodlan	RCHRES 7	112.2
PERLND 107	Annual crops associa	RCHRES 7	218.7
PERLND 108	Sclerophylous vegeta	RCHRES 7	1600.6
PERLND 102	Industrial or commer	RCHRES 7	52.8
IMPLND 102	Industrial or commer	RCHRES 7	158.5
PERLND 109	Sparsely vegetated a	RCHRES 7	561.6
PERLND 110	Discontinuous urban	RCHRES 7	303.2
IMPLND 110	Discontinuous urban	RCHRES 7	303.2
PERLND 103	Green urban areas	RCHRES 7	30.4
IMPLND 103	Green urban areas	RCHRES 7	10.1
PERLND 111	Bare rocks	RCHRES 7	17.4
IMPLND 111	Bare rocks	RCHRES 7	52.1
PERLND 104	Salt marshes	RCHRES 7	0
PERLND 112	Land principally occ	RCHRES 7	143.5
PERLND 105	Non-irrigated arable	RCHRES 7	1048.6
PERLND 101	Airports	RCHRES 6	73
IMPLND 101	Airports	RCHRES 6	73
PERLND 102	Industrial or commer	RCHRES 6	5.2
IMPLND 102	Industrial or commer	RCHRES 6	15.6
PERLND 103	Green urban areas	RCHRES 6	83.8
IMPLND 103	Green urban areas	RCHRES 6	27.9
PERLND 104	Salt marshes	RCHRES 6	1259.7
PERLND 105	Non-irrigated arable	RCHRES 6	1.1

The relative distribution of each sub area is presented on Chart 1. From the data it is clear that Non-irrigated arable land is the dominant land use type in the Kalo Horio catchment. Discontinuous Urban land use also sows quite significant land coverage. Both of these are therefore expected to play a key role in the management of water quality.

Chart 1:

Area coverages of landuse types in the Kalo Horio Subcatchment



2. Determination of emission rates

Pollutant release rates for point sources were estimated from existing data, the experience of DoE engineers regarding similar sources in other areas in Cyprus and from the bibliography. Several point sources are connected to the sewerage network and thus do not directly contribute to the pollutant loading of the salt lake. Industrial sources for which direct estimates could not be made, have been clustered together and will be treated as an area source. Also, the pollutant Release and Transfer Register (PRTR) national inventory was used.

On the tables that follow, the yearly emission rates of PRTR and other point sources which are produced are shown. It is noted that these facilities are connected to the network of the Larnaca Sewerage Board, thus the produced effluents constitute a risk of pollutant loading to the Salt Lake in the case of leakage events. For the purposes of the project, it is assumed that the failure rate is 10%.

Table 4: Emission Rates for Point Sources

A/A	Point Source Name	Salinity/ EC	F-coli	Suspended solids	BODmg/l	DO	Nutrients					Easting	Northing	Connected with Sewage System
							Νιτρικά mg/l	Νιτρώδη mg/l	Total N mg/l	Αμμωνιακά	Φωσφορικά mg/l			
1	Peletico	0	0	0	0	0	-	-	0	0	0	552144.79	3865296.72	
2	Peal Skyrodema	0	0	0	0	0	-	-	0	0	0	552080.90	3865559.97	
3	Skyrodema Konatzii	0	0	0	0	0	-	-	0	0	0	552299.95	3865522.30	
4	Amalia	0	0	0	0	0	-	-	0	0	0	553381.54	3865799.70	
5	Mitsides Flourmills	0	0	0	0	0	-	-	0	0	0	553394.08	3866326.11	
6	Ambrosia	0	0	0	100	0	-	-	500	0	0	553510.70	3866233.30	+
7	Unicare - Vialco	0	0	0	0	0	-	-	0	0	0	553491.82	3866120.63	+
8	Lisko	0	0	0	0	0	-	-	0	0	0	553619.13	3865685.20	
9	Sailor Salt	0	0	0	0	0	-	-	0	0	0	553777.16	3865524.10	
10	GH Poultry and Slaughterhouse	0	0	0	12	0	-	-	21	0	8	548673.75	3866640.98	
11	Roadtech	0	0	0	0	0	-	-	0	0	0	552292.52	3865523.67	
12	Zorpas	0	0	0	0	0	-	-	0	0	0	553753.05	3866005.38	+
13	Lambrianides	0	0	0	0	0	-	-	0	0	0	553785.35	3865985.62	+
14	Souroulas	0	0	0	0	0	-	-	0	0	0	553811.29	3865948.17	+
15	Larnaca Airport	0	0	0	3760	0	-	-	2048	0	700	557213.78	3860178.02	+
16	Keramourgeia Xrysafi	0	0	0	0	0	-	-	0	0	0	551006.36	3862927.40	

Pollutant rates for non point sources were estimated through the BASINS modelling tools and the associated Fecal Tool.

For the implementation of the modelling tools the land use and physical characteristics of the watershed as well as the meteorological conditions had to be determined and incorporated in the model. In addition the models results had to be analysed and calibrated. These activities are described in detail in the Model implementation and calibration activities of the WATER project and will not be repeated in this report. In summary, however it is noted that after the hydrology calibration was undertaken, calibration of water quality was achieved through a multi step process where pollutant contributions and water quality impacts had to be iteratively assessed and fine tuned. The following key constituents were examined during the calibration:

- Water Temperature
- Dissolved Oxygen
- Ammonia as Nitrogen
- Nitrite-Nitrate as Nitrogen
- Orthophosphate as Phosphorus
- BOD/Organics, comprised of
- F. Coli

The calculation of emission rates was achieved through the use of the AGCHEM module of the HSPF model. Modelling emission rates can be found within the model results. Below is a summary of the emission rates for the major land uses of Non-irrigated arable land and discontinuous urban land.

F. Coli emission factors

F. Coli emission factors were calculated through the Fecal Tool. This comprises of an EXCEL spreadsheet which is designed to calculate pollutant inputs on land from various domestic and wild animals including birds. The main assumptions used in the calculation of pollutant emission rates include the following:

- Number of birds and animals in the Kalo Horio area.
- Production of F. Coli per day per animal. These were determined mainly by the use of default values provide with the FECAL Tool's documentation.

The results from the implementation of the Tool show that only Pasture land presents a considerable rate of F. Coli releases. The F.Coli emission rates per day per hectare are presented on Table 5.

Table 5
Seasonal F. Coli emission rates for Pastureland

	MON-ACCUM (count/acre/day)	MON-SQOLIM (count/acre)
January	68866696083	1.2396E+11
February	76245270664	1.37241E+11
March	1.72167E+11	3.099E+11
April	1.77906E+11	2.66858E+11
May	1.72167E+11	2.5825E+11
June	1.77906E+11	2.66858E+11
July	1.72167E+11	2.5825E+11
August	1.72167E+11	2.5825E+11
September	2.13487E+11	3.2023E+11
October	2.066E+11	3.7188E+11
November	71162252619	1.28092E+11
December	68866696083	1.2396E+11

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