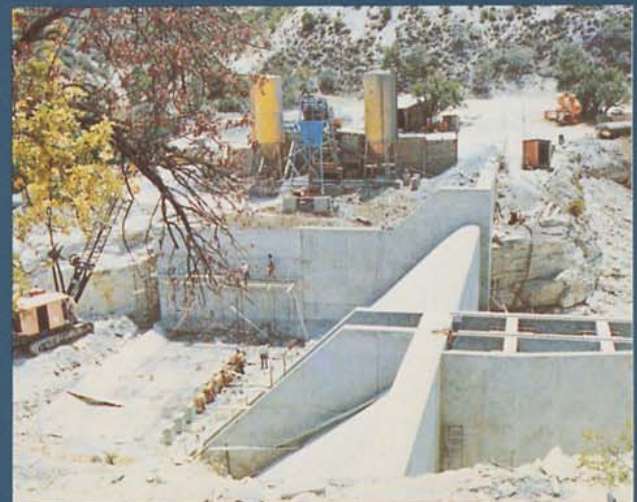


Κυπριακή Δημοκρατία  
Υπουργείο Γεωργίας και Φυσικών Πόρων  
Τμήμα Αναπτύξεως Υδάτων

# ΣΧΕΔΙΟ ΒΑΣΙΛΙΚΟΥ – ΠΕΝΤΑΣΧΟΙΝΟΥ

Vasilikos –  
Pendaskinos  
Project

# VPP



Republic of Cyprus  
Ministry of Agriculture and Natural Resources  
Water Development Department

# ΣΧΕΔΙΟ ΒΑΣΙΛΙΚΟΥ – ΠΕΝΤΑΣΧΟΙΝΟΥ

## VASILIKOS – PENDASKINOS PROJECT

Prepared by the Project Management of  
Vasilikos–Pendaskinos Project

Water Development Department  
Nicosia – June 1985

Τμήμα Αναπτύξεως Υδάτων  
Λευκωσία – Ιούνιος 1985

### Φωτογραφίες εξωφύλλου

- 1 Φράγμα Καλαβασού
- 2 Διύλιστήρια Νερού Κόρνου
- 3 Φράγμα Διποτάμου
- 4 Αντλιοστάσιο Τόχνης
- 5 Φράγμα εκτροπής Μαρωνιού

### Πίσω μέρος εξωφύλλου:

Σχέδιο Βασιλικού-Πεντάσχοινου  
Γενική διάταξη



### Front cover photos

- 1 Kalavasos Dam
- 2 Kornos Water Treatment Plant
- 3 Dhypotamos Dam
- 4 Tokhni Pumping Station
- 5 Maroni Diversion Weir

### Back cover

Vasilikos-Pendaskinos Project  
General plan

### Περιεχόμενα

(Ελληνικό κείμενο)

### Σελίδα

Σκοπός του Σχεδίου .....	1
Θέση του Σχεδίου .....	1
Υδατικοί Πόροι του Σχεδίου .....	1
Χρήση του νερού .....	1
Έργα του σχεδίου .....	1
Φράγμα Καλαβασού .....	1
Φράγμα Διποτάμου .....	1
Εκτροπή Μαρωνιού .....	1
Διύλιστήρια Κόρνου .....	1
Αγωγός Καλαβασού-Χοιροκοιτίας .....	2
Αντλιοστάσιο Τόχνης .....	2
Αδρευτικά δίκτυα .....	2
Γεωργική Ανάπτυξη, Έρευνα και Αναδασμός .....	2
Χρηματοδότηση .....	2
Συνολική δαπάνη .....	3
Διάφορα στοιχεία του Σχεδίου .....	3
Στοιχεία φράγματος Καλαβασού .....	4
Στοιχεία φράγματος Διποτάμου .....	4

### Contents

(English text)

### Page

1 Introduction .....	5
2 Financing .....	5
3 The project area .....	5
4 The water resources .....	6
5 Engineering aspects .....	6
6 Agricultural aspects .....	8
7 Organisation and management for project implementation .....	8
8 Operation and maintenance .....	9
9 Principal contractors .....	9
10 Summary of estimated total costs .....	10
General Project data .....	10
Kalavasos dam data .....	11
Dhypotamos dam data .....	11

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## 1. INTRODUCTION

### 1.1 Objectives

The basic objective of the Vasilikos–Pendaskinos Project is the development of surface and ground water resources from the Vasilikos, Pendaskinos and Maroni rivers both for the agricultural development of the area and the augmentation of the domestic water supply of Nicosia, Larnaca and Famagusta districts.

### 1.2 Feasibility Studies

The planning for the utilization of the flows in the three rivers in the Vasilikos–Pendaskinos area for local irrigation and for supplementing the Larnaca–Famagusta domestic water supplies started as early as 1968, when the Cyprus Water Planning Project was initiated by the Government in association with U.N.D.P and F.A.O. The feasibility studies for the Project were undertaken by the Water Development Department (WDD) aided by other Government Departments and completed by the end of 1977.

### 1.3 Implementation

The Project was implemented in two phases. Design and construction of the first phase was executed between mid 1978 and the end of 1981 at a total cost of about £ 3 million. This provided the means of conveying water from the existing sources in the project area (e.g. Lefkara dam) to Nicosia thereby alleviating to some extent the water supply problems in the capital. On commissioning the second phase works the first phase becomes the means of conveying the augmented potable water supplies from the newly developed sources within the project, to Nicosia.

In January 1981 detailed design of the second phase was started by the Consulting Engineers with responsibility for the design and supervision of the work, Messrs., Rofe, Kennard and Lapworth, with Wallace Evans and Partners (UK) in association with C. Chr. Ioannides (Nicosia).

Construction work on the second phase of the Project started at the end of 1982 and completion of the major components is scheduled by the end of 1985 with some irrigation works and project ancillary work continuing well into 1986.

### 1.4 Estimated Project Cost

The total cost of the Project including the first phase was estimated in 1981 as 31 million Cyprus pounds. The actual cost of the first phase was about £ 3 million. Competitive prices, lower than estimated price fluctuation, and a substantially increased proportion of the construction work being undertaken by the Construction Division of the Water Development Department (direct labour) has reduced the estimated cost of the

second phase to about £ 23.6 million. The total estimated project cost is therefore about £ 26.6 million.

## 2. FINANCING

2.1 Government secured four loans to cover the foreign exchange cost component of the project.

### 2.2 First Phase

Toward the cost of the first phase of the project, Government secured a loan equivalent to about £ 1.9 million leaving a Government contribution to cover the cost balance of £ 1.1 million

### 2.3 The Main Project

Government secured three further loans for the second phase implementation. The largest was from the World Bank for an amount of US\$ 9.9 million, the second from the Kuwait Fund for Arab Economic Development was for 2.5 million Kuwait Dinar and the third from the European Investment Bank for about 9.0 million European Currency Units. The total of these three loans is approximately the equivalent of 13.7 million Cyprus pounds leaving the Government to cover the balance of about 9.9 million Cyprus Pounds of the total estimated 23.6 million Cyprus Pounds cost for the second phase.

### 2.4 Project Manager – UNDP Contribution

In addition to these loans the United Nations Development Programme in Cyprus, through the Food and Agriculture Organisation of the United Nations has committed a grant for the major proportion of the cost of a Project Manager. The amount over about 5 years is about 232,000 US dollars of which a small proportion has been expended on authorised group training.

## 3.0 THE PROJECT AREA

### 3.1 Location

The whole Project Area covers about 1805 ha and is located in the southern part of the Island. It is bounded by the sea in the south and by the eastern part of the Troodos region on the north–western part of the watershed where it reaches altitudes of about 1500 m above sea level.

It is made up of 3 main watersheds, the Pendaskinos on the east, the Maroni watershed in the middle and the Vasilikos watershed in the west.

### 3.2 Geomorphology

Geologically the watersheds are made up of both igneous and sedimentary rocks. Igneous rocks occupy the highest part of the catchment reaching a maximum elevation of 1500 meters a.s.l. and forming steep valleys.



Igneous rocks consisting of multiple diabase dykes, account for 90% of the rock, separated by the occasional thin screen of lava. In the Vasilikos watershed plutonic rocks are also present, being essentially gabbros and serpentines.

Sedimentary rocks overlie the igneous rocks. Lapithos chinks occupy the middle parts of the catchments and consist of chinks and chalky marls. The Lapithos chinks are then underlaid by the Pakhna Formation.

River valleys are overlaid by extensive alluvial deposits running for several kilometers from the two damsites down to the coast.

Carob and olive trees form the main vegetation on the Lapithos and Pakhna formations. The highest parts of the catchment are moderately covered with vegetation including areas of pine trees.

### 3.3 Climate

The project area enjoys a typical Mediterranean climate with hot dry summers and wet winters. Rainfall in the watershed of the project area occurs during the months November to March and varies between 400 mm at the coast to 800 mm at the highest peaks, at altitudes of 1,500m a.s.l. the average rainfall being 450 mm. Winter temperatures are, as a rule, above 0°C and frost occurrence in the area is very unusual. This climate is suitable for the production of citrus and vegetables. Project evaporation data have been collected using sunken-pan evaporimeters at Polemidhia dam station and it has been shown that monthly evaporation exceeds rainfall in all months except those from December to February. The evaporation averages about 1750 mm against a rainfall of 600 mm – 450 mm.

### 3.4 Original Agricultural Development

Most of the project area was under rainfed agriculture, mainly cereals, carobs and olives. However, irrigation was practised over a small part of the area, in the river valleys of Ayios Theodoros village (Pendaskinos river), Maroni (Maroni river) Zyvi-Tokhni and in the Kalavastos valley (Vasilikos river). Crops irrigated by private boreholes and piping or public irrigation works covered an area of 298 ha as follows:

Citrus .....	191 ha
Deciduous .....	7 ha
Table Grapes .....	13 ha
Vegetables .....	87 ha

Citrus orchards continue mainly to be grown in the Pendaskinos valley, below the main Nicosia-Limassol road down to the sea. Vegetables are cultivated in the Maroni and Zyvi-Tokhni area and in the lower part (delta area of the river) of the Ayios Theodoros valley.

## 4.0 THE WATER RESOURCES

### 4.1 Surface Water

The surface water resources of the three basins contributing to the Vasilikos-Pendaskinos Project have been estimated using rainfall records available for every year since 1916 and a mathematical run-off model as follows:

Vasilikos River – Average annual flow 11.0 MCM at Kalavastos Damsite

Maroni River – Average annual flow 3.7 MCM at Maroni Diversion weir

Pendaskinos River – Average annual flow 6.0 MCM at Dhypotamos Damsite

These figures are gross of upstream use.

The engineering structures constructed i.e. Kalavastos and Dhypotamos dams and Maroni Diversion Weir and its conveyor to Dhypotamos Dam have the following nominal capacities:

Kalavastos Dam	17 MCM
Dhypoamos Dam	15 MCM
Maroni Diversion	0.75 m <sup>3</sup> /s

The estimated safe yield from these sources amount to:

Kalavastos Dam	7.65 MCM per annum
Dhypoamos Dam	6.8 MCM per annum (including 2 MCM diverted from the Maroni River)

### 4.2 Groundwater

There are three different types of aquifers in the southern part of the project area:

- the gypsum aquifer
- the sandstone aquifer
- the alluvial aquifer

Due to the construction of dams on both rivers the replenishment of these aquifers will decrease rendering them less important though it is planned to augment the volume of water allocated for irrigation for the Pendaskinos area with 0.5 MCM from the aquifer. As originally conceived the Maroni irrigation area, requiring about 1.01 MCM per annum would be served solely from boreholes in the gypsum aquifer. However, in view of the findings of recent work at the Agricultural Research Institute Sub-Station on the Project, which demonstrated the harmful effects of high sulphate water on crops and soil structure, it has been decided to use water from Kalavastos Dam, and later from the Southern Conveyor. It will however be possible to use some borehole water if and when safe dilution levels are proved, and on soil that has previously been irrigated with high sulphate water.

## 5. ENGINEERING ASPECTS

The Project consists of the following main elements:

**5.1 Kalavastos Dam:** A rockfill dam on the Vasilikos River, 5.5 km northwest of Kalavastos village and only 250 m upstream of the old Kalavastos Mine Offices of the Hellenic Mining Company to supply 5.65 MCM per year of water to the Vasilikos irrigation area and 2 MCM per year to Khirokitia Treatment Plant for domestic purposes. The dam is about 60 m high above foundation level, with a crest length of some 500 m, and creates a storage reservoir with a total capacity of 17 MCM. The reservoir extends about 2 km upstream

and will have a surface area of 1.0 km<sup>2</sup> at a full storage level of 178.5 m above mean sea level.

The construction work undertaken by the Joint Venture Messrs Joannou and Paraskevaides with the MEDCON Construction Co Ltd started on 3rd January 1983 and the accelerated impounding date of December 1984 was achieved. The total cost of the Dam is estimated at £ 5,934,000.

**5.2 Dhyptomamos Dam:** This is the other main storage facility within the Vasilikos–Pendaskinos Project to be used mainly for the improvement of the Nicosia domestic water supply with 5 MCM per year allocated annually to the New Kornos Water Treatment Works with an additional 1.8 MCM per year allocated to the Pendaskinos Irrigation Area.

It is a rockfill dam, located on Pendaskinos river a few metres downstream of the confluence of the Syrkatis and Mylou tributaries, 3.3 km north of Skarinou station. The height of the Dhyptomamos dam is about 62 m above foundation and the dam crest is about 450 m long. The capacity of the dam will be 15.0 MCM with its full storage top water level at 175 m above mean sea level. The surface area at full storage level would be about 1.3 km<sup>2</sup>. The reservoir would extend about 2.8 km upstream of the dam axis in the Syrkatis tributary and 1.8 km in the Mylou tributary.

The construction works undertaken by the joint venture Shephard Hill Ltd with G.P. Zachariades Ltd. started on 2nd November 1982 with impounding achieved in January 1984. The cost of the dam is estimated to be £ 3,760,000.

**5.3 Maroni Diversion:** In view of the lack of a technically feasible damsite on the Maroni river, it was decided to divert a proportion of the flow of the river to a point upstream of Dhyptomamos Dam. The diversion system comprises a 5 m high mass concrete weir with maximum impounded capacity of about 50,000 m<sup>3</sup>, on the Maroni river and with diversion works which feed water via a pipeline of 800 and 700 mm dia to Dhyptomamos Reservoir at rates of upto 0.75 m<sup>3</sup>/s, and total 2 MCM annually, i.e. 53% of the estimated mean annual flow of Maroni river. The surplus water of the river will be used for the irrigation of the Maroni river valley downstream.

The construction works undertaken by G. P. Zachariades Ltd started on 2nd May 1984 at a tender cost of £1,255,554 and are due for completion at the end of July 1985.

**5.4 Maroni Irrigation Scheme:** This comprises an irrigation network covering about 229 ha of land in the delta area of the Maroni river. It will be served initially with water from Kalavastos dam and later the Southern Conveyor with scope if necessary and acceptable for mixing water from the gypsum aquifer. Construction is by direct labour at an estimated cost of £670,000 for completion in stages between June and August 1985.

**5.5 Vasilikos Irrigation Scheme:** This comprises a conveyance and distribution system for irrigation from

Kalavastos Dam, comprising, main conveyor, break pressure tank, and pipeline networks covering an area of about 837 ha in the Vasilikos valley and delta area. Construction is by Direct Labour at an estimated cost of £2.25 million for completion in stages between August 1985 and autumn 1986 though a proportion will not be completed until land consolidation in the Kalavastos village area is completed in early 1987.

**5.6 Pendaskinos Irrigation Area:** About 376 ha of irrigation network in the Pendaskinos Valley and delta area are to be served by the Dhyptomamos dam and existing boreholes. Construction is by Direct Labour at a cost of about £1.6 million for completion in June to August 1985.

**5.7 Kalavastos – Khirokitia Pipeline with Tokhni Pumping Station:** This is the main conveyor of water from Kalavastos dam to the existing treatment plant at Khirokitia (via Tokhni pumping station) and of irrigation water from the same source to the Vasilikos irrigation area. Some 18 km of pipeline are involved in diameters up to 900 mm with peak nominal capacity of 940 litres per second. The Contract included an 8500 cu.m. balancing reservoir at the Khirokitia Treatment Plant and a small break pressure tank. The new Tokhni Pumping Station boosts the proportion of dam water required (up to a maximum of 410 litres/sec) for treatment to potable standards at Khirokitia water treatment works. The work, executed by Direct Labour was started on 1st September 1983 and was completed at the end of 1984 at an overall cost of about £2.1 million.

## **5.8 Nicosia Water Supply – Phase I and II**

### *Phase I:*

As described earlier one of the basic objectives of the Project is to augment the Nicosia domestic water supply. The construction of the Skarinou–Nicosia pipeline within the Nicosia Water Supply Phase I Scheme preceded the Vasilikos–Pendaskinos Main Project but as part of the Project. Phase I was completed early in 1982. It includes Dhyptomamos Pumping Station, Stavrovouni balancing reservoir, Nissou Break Pressure Tank and the new Lakatamia Reservoir. During Phase I the system is supplied with water from the original Khirokitia–Phrenaros pipeline at Skarinou. Dhyptomamos pumping station boosts the water to Stavrovouni balancing reservoir and from there it gravitates through Nissou Break Pressure Tank, and on to Lakatamia reservoir an overall distance of some 40 km. These works commenced in April 1980 and the Civil Engineering Works were undertaken by Messrs Joannou and Paraskevaides at a cost of about £1,000,000. The total cost of the whole of phase I was about £3,000,000.

The consulting engineers responsible for the design and supervision of this phase were Messrs Lemon and Blizard of Southampton, UK.

### *Phase II:*

This Phase utilizes water from Lefkara and/or Dhyptomamos dam for treatment to potable standards

up to a maximum of 32,000 cubic metres per day at the new Kornos Treatment Works. Construction here, undertaken by Charilaos Apostolides Ltd, started in November 1983 for completion by September 1985 at a cost of about £2.5 million including the water treatment equipment and the pumps which will lift the treated water to Stavrovouni Balancing Reservoir and the Phase I trunk pipeline at rates up to 495 litres/sec.

## 6. AGRICULTURAL ASPECTS

### 6.1 Soils

The project area is dominated by alluvial soils among the river valleys and colluvial soils in the coastal plain. These are deep soils, free from excessive quantities of lime, suitable for the cultivation of most crops.

### 6.2 Cropping Pattern

The cropping pattern for the Vasilikos–Pendaskinos Project will not only depend on land suitability and climatic conditions but also on market requirements, profitability and labour availability. In the studies so far on average the following cropping patterns have been anticipated by area:

Vasilikos Irrigation Area

- |               |     |
|---------------|-----|
| 1. Citrus     | 50% |
| 2. Vegetables | 50% |

Pendaskinos Irrigation Area

- |                                   |     |
|-----------------------------------|-----|
| 1. Citrus (Permanent Plantations) | 90% |
| 2. Vegetables                     | 10% |

Maroni Irrigation Area

- |                    |     |
|--------------------|-----|
| 1. Permanent Crops | 10% |
| 2. Vegetables      | 90% |

### 6.3 Benefits

As has been seen the project has two purposes. Firstly about 9 MCM of water per year will be provided for irrigation. Besides the existing irrigated area of 298 ha, new areas of about 1440 ha between the Vasilikos and Pendaskinos rivers will be irrigated. Secondly about a further 7 MCM of water per year will be supplied to augment the domestic needs of Nicosia, Larnaca and Famagusta.

### 6.4 Land Tenure

Land tenure aspects in any project area are very important as they are critical factors in determining the kind of farms which are likely to develop after the implementation of the project.

In Cyprus land tenure is complicated with problems such as small size of ownership, fragmentation of ownerships and dispersal of plots, ownerships in undivided shares, lack of access to the plots etc.

For all practical purposes the project area can be considered as privately owned land, with land belonging to companies or the State constituting a very small proportion of the total.

Within the areas to undergo land consolidation the small holdings are dominant with the average size of holding being 0.81 ha and the average size of plot or share being only 0.5 ha. The average number of plots or shares per holding is 1.6 and generally, fragmentation increases as the size of holding increases.

### 6.5 Land Consolidation

Because of the land tenure problems in the area, as

well as the need both to improve the infrastructure and facilitate the optimum design of the irrigation networks, the implementation of land consolidation was considered essential.

As experience from other completed land consolidation schemes has shown land consolidation's contribution is substantial towards the enlargement of holdings and the size of plots, the reduction of fragmentation, the elimination of dual and undivided ownerships, the construction of rural roads, the improvement of plot shape, the reduction of the cost of irrigation networks, etc.

Land consolidation in the project area is implemented in three schemes on a total area of about 500 ha within the administrative boundaries of 5 villages. A part of the project area to be irrigated was excluded from land consolidation mainly due to the existence and distribution of Turkish-owned properties. It is the Cyprus Government's policy not to consolidate land in this category without the consent of their owners.

The plans provide for a total of approximately 34 km of rural roads to be constructed within the areas to undergo consolidation, and approximately a further 16 km in non-consolidated areas.

### 6.6 Agricultural Research

Research is carried out by the Agricultural Research Institute. The headquarters are in Nicosia, but there are several experimental stations in rural areas mostly concerned with applied, not general research and experimentation.

For the needs of the project, a research sub-station in the project area has been established. The programme includes research in relation to crop and water suitability, production techniques and management, irrigation, fertilization, crop protection, packaging and transportation.

### 6.7 Agricultural Extension

The extension service of the Department of Agriculture is used for the implementation of agricultural policy. At Project level a District Agricultural Officer is responsible for the supervision and co-ordination of the various beats in his district. Beats are groups of villages under the responsibility of a beat agent who acts as the link between the farmers and the various extension facilities and specialists at the District Office. A Project Beat Officer has been appointed and a team of several other extension specialists e.g. on citrus fruit, vegetables and water use will be completed as the needs of the agricultural elements in the Project require.

## 7. ORGANISATION AND MANAGEMENT FOR PROJECT IMPLEMENTATION

The main instruments of the organisation, management and subsequent operation and maintenance of the Project are briefly describes below:

### 7.1 Policy Level

Project policy and coordination of the activities of all the Government Departments concerned is achieved



through a high level body, called the Project Policy and Coordination Committee (PPCC) with the Minister of Agriculture and Natural Resources as chairman, the Director of the Water Development Department (WDD) as secretary and other senior members from all Ministries involved with the Project.

### 7.2 Executive Level

The main executive body of the Project during its implementation, operation and maintenance is the Water Development Department. The services of some other Departments are also utilised. The Agricultural Department will be responsible for the on-farm development works and together with the Agricultural Research Institute will provide agricultural extension and research services. Other Departments involved are the Ministry of Finance, Planning Bureau, Tender Board and Accountant General and Auditor General, Geological Survey Dept. etc.

### 7.3 Advisory Level

An advisory body at regional level with knowledge of local affairs representing all interested disciplines has been established under the chairmanship of the District Officer. This body is called the Project Advisory Committee and directly advises the Project Manager on local developments affecting the project and problems faced by the farmers as well as explaining to the farmers the project objectives and advising them on the efficient use of the water resources.

## 8. OPERATION AND MAINTENANCE

The executive body of the Project Management will be the Department of Water Development through a Manager properly assisted by the Agricultural Department.

All water legislation will be controlled through the Director of Water Development both for the Project Areas as well as for all water catchment areas upstream.

The WDD will also be responsible for selling the water either in bulk to the Irrigation Divisions or to private consumers.

## 9. PRINCIPAL CONTRACTORS

9.1 KALAVASOS DAM – Joannou and Paraskevaides with the Medcon Construction Co Ltd.

9.2 DHYPOTAMOS DAM – Shephard Hill Ltd. (U.K.) with G. P. Zachariades Ltd.

Sub Contractors – (Both dams)

Grouting Works: Colcrete Ltd. U.K.

Valves and hydraulic control equipment: J. Blakeborough and Sons Ltd U.K.

Handrailing and flooring: Gasco Ltd. U.K.

9.3 MARONI DIVERSION–

Civil Works – G.P. Zachariades Ltd.

Ductile Iron Pipe Supply Subcontractor – Thyssen (Germany)

9.4 TOKHNI PUMPING STATION–  
Civil Works – Water Development Department  
Pump Plant – Weir Pumps Ltd (U.K.)

9.5 KORNOS TREATMENT WORKS  
Civil Works – Charilaos Apostolides Ltd.  
Water Treatment Plant – Degremont Laing Ltd. (U.K.)

9.6 KALAVASOS – KHIROKITIA PIPELINE  
Civil Works: Water Development Department.  
Supply Contracts

Pipes: Thyssen (Germany)

Valves: Guest and Chrimes Ltd. (U.K.)

Flowmeters: Bestobel Sparling Ltd(U.K.)

Float Valves: Glenfield and Kennedy Ltd. (U.K.)

Pressure Sustaining valve: Bayard Exports (France)

9.7 THE VASILIKOS, PENDASKINOS AND MARONI IRRIGATION AREAS.

Civil Works: Water Development Department

Supply Contracts:

A. C. Pipes: Cyprus Pipe Industries Ltd. (Cyprus)

Fittings: Metalicas Fundiciones (Spain).

UPVC pipes: Hellenic (Greece) and Cosmoplast (Cyprus)

Valves: ISI (Italy)

Glenfield and Kennedy Ltd. (U.K.)

Blakeborough Ltd (U.K.)

Hydrants: Schlumberger – Flonic (France)  
and

Bayard (France)

Meters: Bestobell Sparling Ltd (U.K.)



10. SUMMARY OF ESTIMATED TOTAL PROJECT COSTS (Cyprus Pounds)

**Civil, Mechanical and Electrical Works by Contract**

	£
Kalavassos Dam .....	5 934 000
Dhypotamos Dam .....	3 736 000
Maroni Diversion .....	1 294 000
Pumping Plant for Tokhni and Kornos	
Pumping Stations .....	662 000
Treatment Plant for Kornos Treatment	
Works .....	749 000
Civil Works for Kornos Treatment Works	1 349 000
Telemetry .....	167 000
Project Headquarters .....	66 200
<b>Total .....</b>	<b>£13 957 200</b>

**Civil Works executed by the Water Development Department's Construction Division (Direct Labour)**

Lefkara pipeline Diversion .....	600 000
Tokhni Pumping Station .....	193 600
Telemetry cable laying .....	37 000
Kalavassos – Khirokitia Pipeline .....	2 106 000
Vasilikos Irrigation Area .....	2 250 000
Pendaskinos Irrigation Area .....	1 340 000
Maroni Irrigation Area .....	670 000
<b>Total .....</b>	<b>£7 196 600</b>

**Infrastructure and Administration**

Agricultural Research Station .....	108 000
Purchase of vehicles and Equipment .....	140 000
Survey Work and Investigation by the	
Water Development Dept .....	136 500
Administration and Supervision .....	600 000
Land Consolidation .....	230 000
Land Acquisition .....	100 000
<b>Total .....</b>	<b>£1 314 500</b>

**Fees**

Consulting Engineers .....	896 000
Panel of Experts .....	25 000
Hydraulic Model Testing .....	40 000
	<b>£961 000</b>
Contingencies .....	200 000
<b>Total estimated cost .....</b>	<b>23 629 300</b>
First Phase completed in late 1981 .....	3 000 000
<b>Total first and second phase .....</b>	<b>£26 629 300</b>

**VASILIKOS-PENDASKINOS PROJECT DATA**

<b>Financing</b>	£
GOVERNMENT OF CYPRUS .....	11 000 000
WORLD BANK .....	5 200 000
KUWAIT FUND .....	4 500 000
EUROPEAN INVESTMENT BANK .....	4 000 000
KREDITANSTALT FÜR	
WEIDERAUFBAU (Phase I) .....	1 900 000
<b>Total estimated cost (Jan. 84) .....</b>	<b>£26 600 000</b>

**Consulting Engineers**

ROFE, KENNARD AND LAPWORTH WITH  
WALLACE EVANS + PARTNERS  
in association with C CHR IOANNIDES  
LEMON & BLIZARD (Phase I)

**Main Technical Data**

<b>Design allocation of water</b>	cu.m/year
POTABLE .....	7 000 000
IRRIGATION .....	8 950 000

**Dams Storage**

	cu.m/year
KALAVASSOS DAM .....	17 000 000
DHYPOTAMOS DAM .....	15 000 000
<b>Treatment Works Capacity</b>	cu.m/day
KORNOS WATER TREATMENT WORKS	32 000
<b>Net Irrigated Areas</b>	Ha
MARONI .....	230
PENDASKINOS .....	377
VASILIKOS .....	840
<b>Total .....</b>	<b>1 447</b>

**Completions:**

Nicosia Water Supply First Phase .....	Jan 82
Start impounding .....	Jan 85
Completion of main components .....	End 85

### KALAVASOS DAM DATA

TYPE .....	ROCKFILL	
CONSTRUCTED .....	1983-1985	
CATCHMENT AREA .....	95.5 sq. km	
RESERVOIR {	Area .....	100 hectares
	Capacity .....	17 MCM
EMBANKMENT {	Height .....	60.3 m
	Length .....	500 m
	Volume .....	1.7 MCM
SPILLWAY DISCHARGE .....	600 cu.m/sec	
OUTLET TUNNEL DISCHARGE .....	78 cu.m/sec	
OUTLET PIPE DISCHARGE (for irrigation & domestic use) .....	940 litres/sec (max)	
PLANNING .....	WATER DEVELOPMENT DEPARTMENT	
DESIGN .....	ROFE, KENNARD & LAPWORTH jointly with WALLACE EVANS & PARTNERS in association with C. CHR. IOANNIDES	
CONSTRUCTION .....	J & P AND MEDCON (joint venture)	
OPERATION AND MAINTENANCE .....	WATER DEVELOPMENT DEPARTMENT	
NET IRRIGATED AREA .....	1070 ha	
MAIN CROPS .....	CITRUS AND VEGETABLES	
VILLAGES BENEFITED .....	KALAVASOS, MARI, ZYVI, TOKHNI, PSEMATSMENOS AND MARONI	
ALLOCATION OF WATER {	Potable .....	2.00 MCM/ANNUM
	Irrigation .....	5.65 MCM/ANNUM

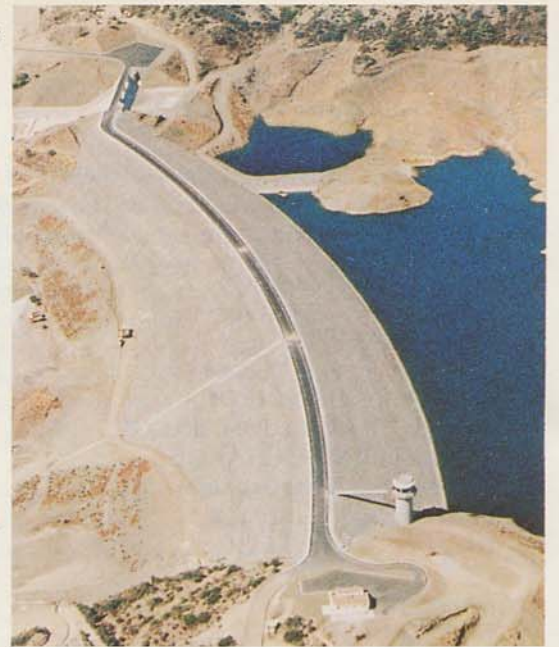
### DHYPTAMOS DAM DATA

TYPE .....	ROCKFILL	
CONSTRUCTED .....	1982-1985	
CATCHMENT AREA .....	79 sq. km	
RESERVOIR {	Area .....	131 hectares
	Capacity .....	15 MCM
EMBANKMENT {	Height .....	61.8 m
	Length .....	450 m
	Volume .....	1 MCM
SPILLWAY DISCHARGE .....	500 cu.m/sec	
OUTLET TUNNEL DISCHARGE .....	65 cu.m/sec (max)	
OUTLET PIPE DISCHARGE for domestic use .....	825 litres/sec (max)	
for irrigation .....	300 litres/sec (max)	
PLANNING .....	WATER DEVELOPMENT DEPARTMENT	
DESIGN .....	ROFE, KENNARD & LAPWORTH jointly with WALLACE EVANS & PARTNERS in association with C. CHR. IOANNIDES	
CONSTRUCTION .....	SHEPHARD HILL - G.P. ZACHARIADES (joint venture)	
OPERATION AND MAINTENANCE .....	WATER DEVELOPMENT DEPARTMENT	
NET IRRIGATED AREA .....	377 ha	
MAIN CROPS .....	CITRUS AND VEGETABLES	
VILLAGES BENEFITED .....	SKARINOI AND AYIOS THEODHOROS	
ALLOCATION OF WATER {	Potable .....	5.0 MCM/Annum
	Irrigation .....	1.8 MCM/Annum





2



1 Φράγμα Καλαβασού. Κατασκευή αναχώματος. Kalavassos dam embankment during construction.

2 Αεροφωτογραφία του φράγματος Καλαβασού. Aerial view of Kalavassos dam (28.6.85)

3 Τοποθέτηση σωληναγωγού Καλαβασού-Χιροκοιτίας. Kalavassos-Khirokitia pipeline construction.

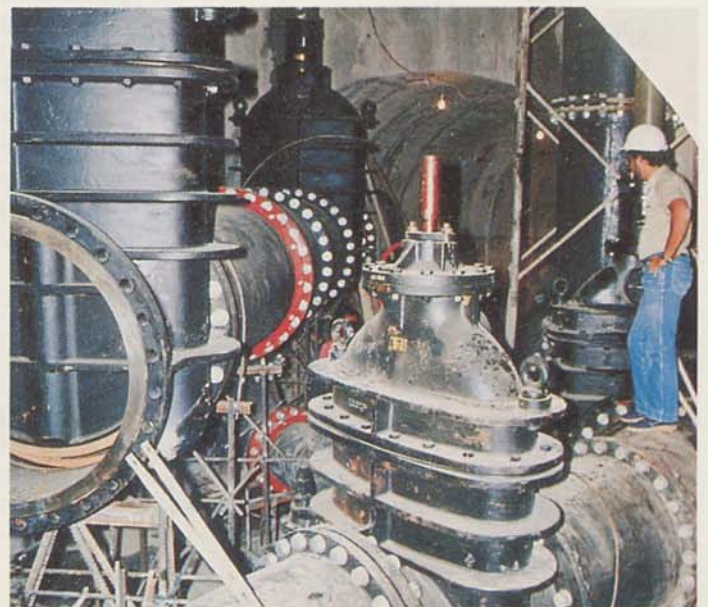
4 Φράγμα Καλαβασού. Συναρμολόγηση προενταμένων σιμεντοδοκών του υπερχειλιστή. Kalavassos dam. Assembly of pre-stressed concrete spillway beams.

5 Θάλαμος δικλειδών φράγματος Καλαβασού Kalavassos dam valve chamber.

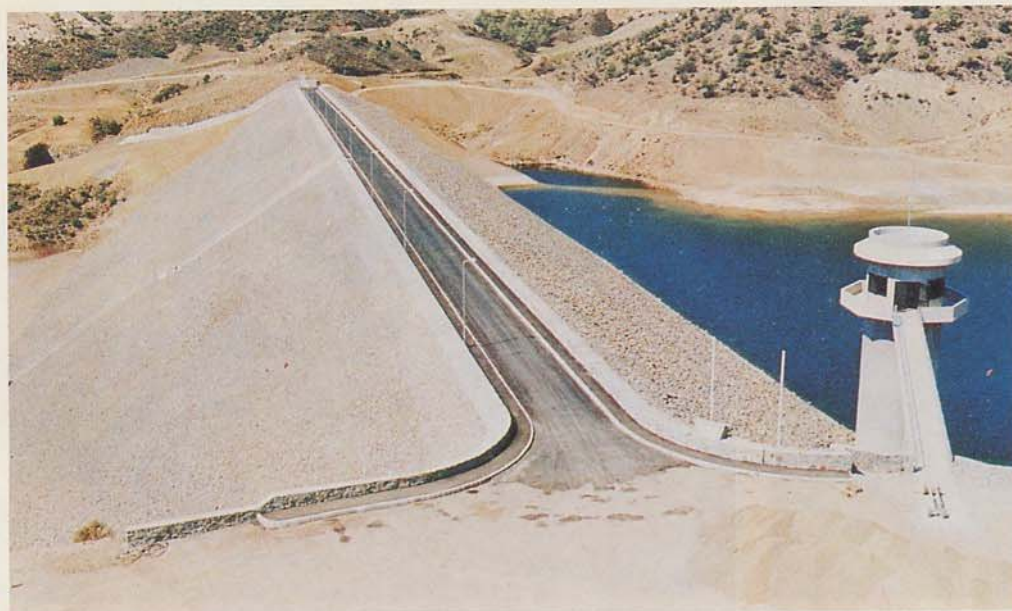
Σημ.: Αυτή η σελίδα και οι επόμενες δύο τυπώθηκαν τον Δεκ. 1985.  
Note: This page and the next two pages were printed in Dec. 1985



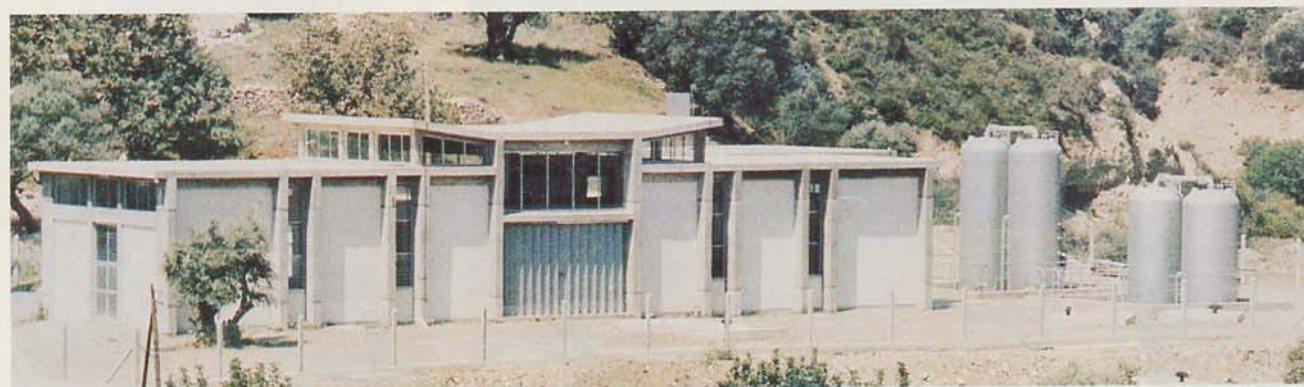
5



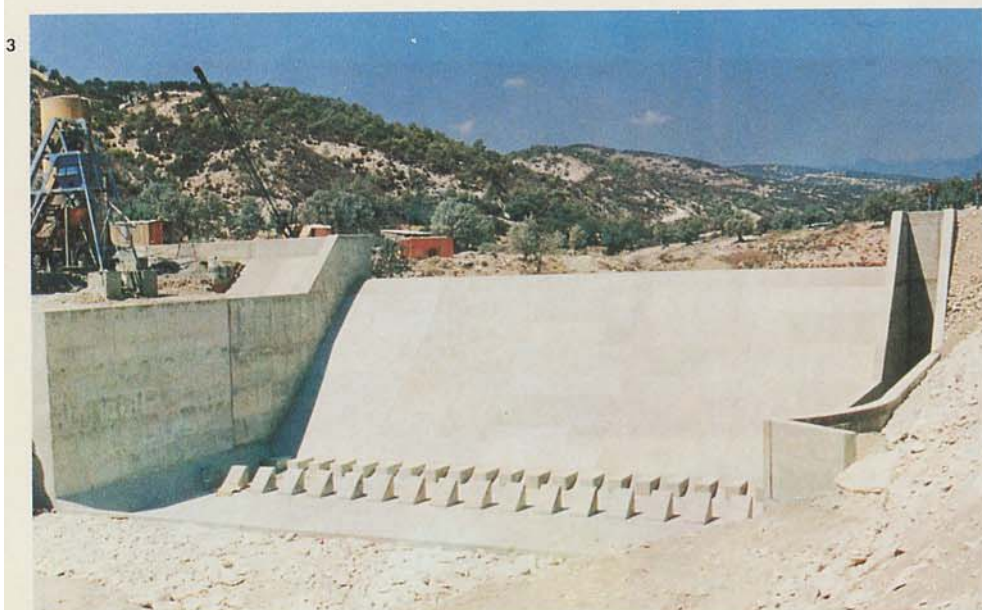
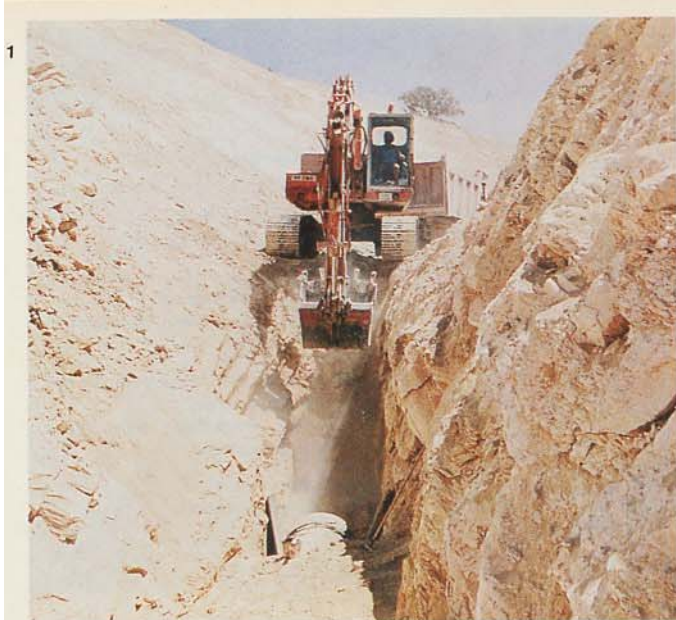




- 1 Φράγμα Διποτάμου  
Dhyrotamos dam.
- 2 Αντλιοστάσιο Διποτάμου  
Dhyrotamos pumping station.
- 3 Ο υπερχειλιστής του φράγματος  
Διποτάμου υπό κατασκευή  
Dhyrotamos dam spillway during construction.
- 4 Τοποθέτηση αγωγού στην περιοχή άρ-  
δευσης Πεντασχοίνου.  
Pendaskinos irrigation area. Pipe  
network construction.
- 5 Αντλιοστάσιο Τόχνης.  
Tokhni pumping station.







1 Τοποθέτηση σωληναγωγού εκτροπής του Μαρωνίου.  
Maroni diversion pipeline construction in deep cut section.

2 Κατασκευή της δεξαμενής άρδευσης Μαρωνίου.  
Maroni irrigation area balancing reservoir under construction.

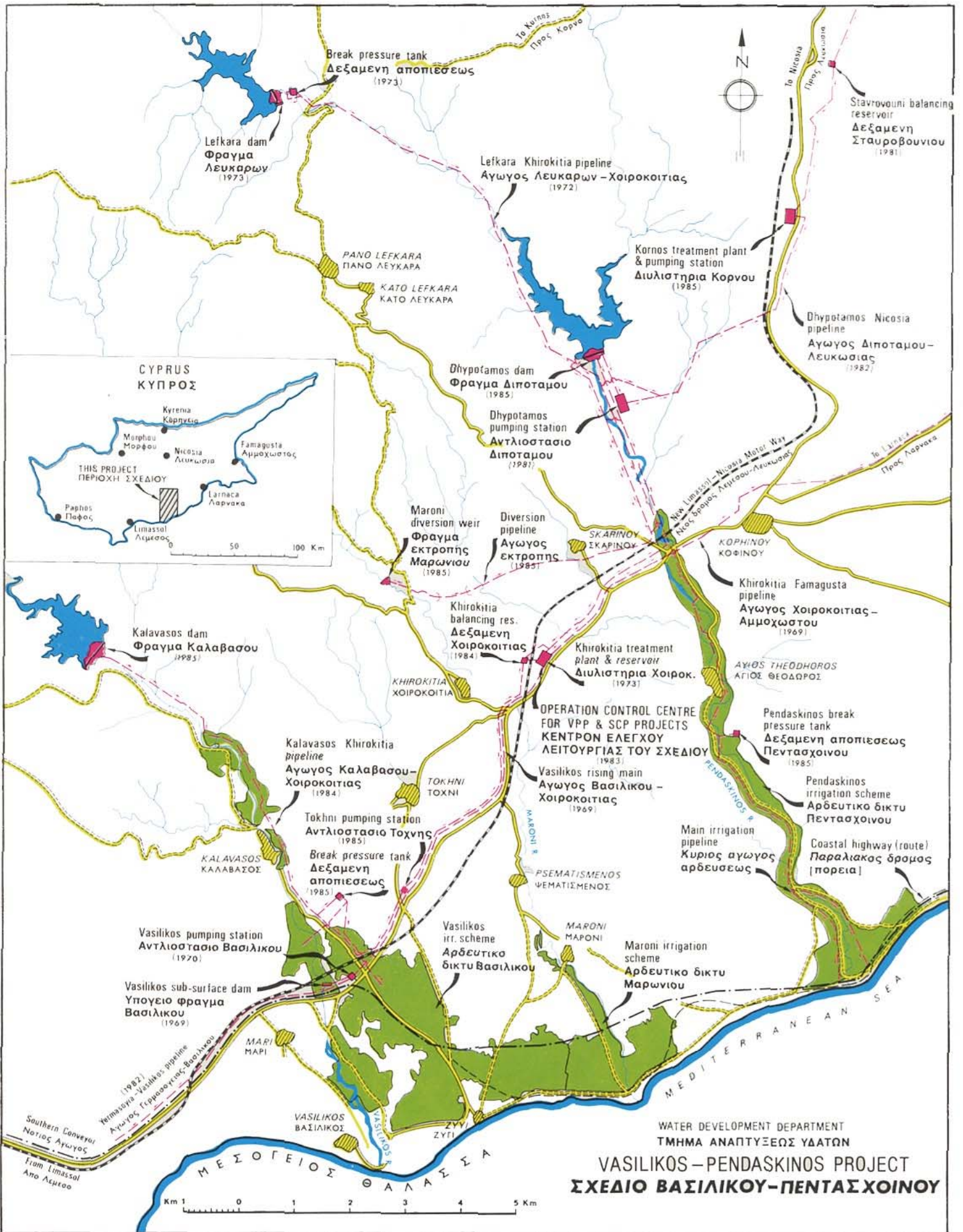
3 Φράγμα εκτροπής Μαρωνίου.  
Maroni diversion weir.

4 Αντλιοστάσιο διυλισμένου νερού στα διυλιστήρια Κόρνου.  
Kornos treatment works. Treated water pumping station.

Φίλτρα και άλλες δεξαμενές καθαρισμού των διυλιστηρίων Κόρνου.  
Kornos treatment works.  
Filters and clarifiers.







WATER DEVELOPMENT DEPARTMENT  
 ΤΜΗΜΑ ΑΝΑΠΤΥΞΗΣ ΥΔΑΤΩΝ  
**VASILIKOS - PENDASKINOS PROJECT**  
**ΣΧΕΔΙΟ ΒΑΣΙΛΙΚΟΥ - ΠΕΝΤΑΣΧΟΙΝΟΥ**