

**WELLAND
AND
NENE
RIVER
AUTHORITY**

**SEVENTH
ANNUAL
REPORT
1971-1972**



WELLAND AND NENE RIVER AUTHORITY

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ANNUAL REPORT

1971-1972

Chairman

T. R. PICK, Esq., O.B.E.

Vice Chairman

COUNTY ALDERMAN H. C. L. WARWICK
(to 14th May 1971)

ALDERMAN T. H. COCKERILL
(from 30th June 1971)

OUNBLE
Peterborough

D. S. AKROYD
Clerk of the Authority

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PREFACE

This Report is published as required by section 110 of the Water Resources Act 1963, and is in the form and contains particulars as directed by the Minister of Agriculture, Fisheries and Food and the Minister of Housing and Local Government.

The Welland and Nene River Authority were constituted by the Welland and Nene River Authority Constitution Order 1964 (S.I. No. 1030) made by the Minister of Housing and Local Government and the Minister of Agriculture, Fisheries and Food in exercise of the powers conferred on them by sections 3, 7 and 134 of the Water Resources Act, 1963.

The Minister of Agriculture, Fisheries and Food in accordance with the provision of section 6(3) of the Water Resources Act, 1963 made five appointments of persons qualified in respect of land drainage, two appointments of persons qualified in respect of fisheries, and two appointments of persons qualified in respect of agriculture.

The Minister of Housing and Local Government in accordance with the provisions of that section made two appointments of persons qualified in respect of public water supply and two appointments of persons qualified in respect of industry other than agriculture.

When it was decided to raise a drainage charge in the year commencing 1st April 1971 the Minister of Agriculture, Fisheries and Food appointed one additional member "from amongst persons appearing to him to represent occupiers of chargeable hereditaments", and in consequence the Minister and the Secretary of State for the Environment gave a direction that the additional local authority member to be appointed under section 8(5) should be appointed by the County Borough of Northampton.

The number of local authority members at the present time and so long as a drainage charge is levied is therefore:

<i>County</i>							<i>No. of Members</i>
Bedford	..	..	..	..	..	..	None
Buckingham	..	..	..	..	..	..	None
Cambridgeshire and Isle of Ely	..	..	..	..	..	..	One
Huntingdon and Peterborough	..	..	..	..	..	..	Two
Leicester, Rutland	..	..	..	..	..	..	One jointly
Lincoln, Parts of Holland	..	..	..	..	..	..	One
Lincoln, Parts of Kesteven	..	..	..	..	..	..	One
Norfolk	..	..	..	..	..	..	None
Northampton	..	..	..	..	..	..	Six
<i>County Borough</i>							
Northampton	..	..	..	..	..	..	Three

One of the two members appointed by Huntingdon and Peterborough County Council shall be from among persons nominated by Peterborough Municipal Borough Council.

One of the six members appointed by Northampton County Council shall be from among persons nominated by Corby Urban District Council.

The River Authority came into existence on the 15th October, 1964 (S.I. No. 1267) and took over the functions assigned to them on the 1st April, 1965. The first meeting was held at Peterborough on the 17th November, 1964. The second re-constitution took place on the 1st November, 1970, and the present appointments are due to expire on the 31st October, 1973.

The Area comprises 1,547 square miles, of which 934 square miles are in the Nene Hydro-metric area and 613 square miles are in the Welland Hydrometric area. The total length of main

river on the 31st March 1971 was 620 miles, the length of the River Nene and tributaries being 331 miles, and the length of the River Welland and tributaries being 289 miles. The estimated penny rate product for 1971-72 was £345,299. The precept of the County and County Borough Councils for the year ended 31st March 1972 was 1.2 pence, and produced £414,359. The contribution required of internal drainage boards amounted to £85,074. Annual loan charges amounted to £166,552.

MEMBERSHIP

1. MEMBERSHIP OF THE AUTHORITY

CHAIRMAN OF THE AUTHORITY

T. R. Pick Esq., O.B.E.

VICE CHAIRMAN OF THE AUTHORITY

County Alderman H. C. L. Warwick
(to 14th May 1971)

Alderman T. H. Cockerill
(from 30th June 1971)

MEMBERS AND APPOINTING AUTHORITIES

Appointed by Cambridgeshire and Isle of Ely County Council

County Councillor M. H. T. Carter

Appointed by Huntingdon and Peterborough County Council

County Alderman Lt. Col. the Hon. P. E. Brassey, J.P., D.L.

Alderman G. A. Foster (*appointed on the nomination of Peterborough Municipal Borough Council*)

Appointed by Leicester and Rutland County Councils, jointly

The Rt. Hon. the Earl of Gainsborough

Appointed by Lincoln (Parts of Holland) County Council

County Alderman H. Waltham

Appointed by Lincoln (Parts of Kesteven) County Council

County Alderman J. H. Lewis

Appointed by Northampton County Council

County Councillor J. R. Carr (*appointed on the nomination of Corby Urban District Council*)

Alderman C. E. Goode

County Councillor W. D. Morton (*from 15th July 1971*)

County Alderman Mrs. D. P. Oxenham, C.B.E., J.P.

County Councillor R. E. Sutton (*from 15th July 1971*)

County Councillor T. A. Thorpe (*to 30th April 1971*)

County Alderman H. C. L. Warwick (*to 14th May 1971*)

County Alderman E. E. Wright, M.B.E.

Appointed by Northampton County Borough Council

Alderman T. H. Cockerill

Alderman J. B. Corrin

Councillor G. J. Onn (*from 25th October 1971*)

Appointed by the Minister of Agriculture, Fisheries and Food as being qualified in respect of Land Drainage

R. J. Berry, Esq.

G. H. Hoyles, Esq.

Major J. E. Piccaver, J.P.

T. R. Pick, Esq., O.B.E.

A. C. Pyrah, Esq., J.P.

Appointed by the Minister of Agriculture, Fisheries and Food as being qualified in respect of Fishery Interests

R. Edgley, Esq.

P. H. Tombleson, Esq., F.Z.S.

Appointed by the Minister of Agriculture, Fisheries and Food as being qualified in respect of Agriculture

H. J. T. Carter, Esq.

D. L. Parker, Esq.

Appointed by the Minister of Agriculture, Fisheries and Food as being qualified to represent occupiers of chargeable hereditaments

A. T. C. Haywood, Esq. (*from 4th August 1971*)

Appointed by the Secretary of State for the Environment as being qualified in respect of Public Water Supply

Councillor C. S. Bowering

L. H. Brown, Esq., B.Sc., F.I.C.E., M.I.W.E.

Appointed by the Secretary of State for the Environment as being qualified in respect of Industry other than Agriculture

N. A. Pearce, Esq., B.E.M.

A. J. W. Scopes, Esq.

2. MEMBERSHIP OF STATUTORY AND STANDING COMMITTEES

Finance and General Purposes Committee

T. R. Pick, Esq., Chairman
County Alderman H. C. L. Warwick, Vice-Chairman
(to 14th May 1971)
Alderman T. H. Cockerill, Vice-Chairman
(from 21st July 1971)

R. J. Berry, Esq.
Lt. Col. the Hon P. E. Brassey
County Councillor J. R. Carr
(from 22nd September 1971)
H. J. T. Carter, Esq.
Alderman J. B. Corrin
Alderman G. A. Foster

G. H. Hoyles, Esq.
(from 22nd September 1971)
County Alderman Mrs. D. P. Oxenham
N. A. Pearce, Esq.
P. H. Tombleson, Esq.
County Alderman H. Waltham
County Alderman E. E. Wright

Land Drainage Committee

H. J. T. Carter, Esq., Chairman
R. J. Berry, Esq., Vice Chairman

County Councillor M. H. T. Carter
Alderman T. H. Cockerill
(from 30th June 1971)
The Rt. Hon the Earl of Gainsborough
A. T. C. Haywood, Esq.
(from 22nd September 1971)
G. H. Hoyles, Esq.
County Alderman J. H. Lewis
County Councillor W. D. Morton
(from 22nd September 1971)

D. L. Parker, Esq.
Major J. E. Piccaver
T. R. Pick, Esq.
A. C. Pyrah, Esq.
County Councillor T. A. Thorpe
(to 30th April 1971)
County Alderman H. Waltham
County Alderman H. C. L. Warwick
(to 14th May 1971)

Fisheries and Pollution Prevention Committee

Alderman G. A. Foster, Chairman
P. H. Tombleson, Esq., Vice-Chairman

Councillor C. S. Bowering
County Councillor J. R. Carr
Alderman T. H. Cockerill
(from 30th June 1971)
Alderman J. B. Corrin
R. Edgley, Esq.
Alderman C. E. Goode
Councillor G. J. Onn
(from 25th October 1971)
N. A. Pearce, Esq.

T. R. Pick, Esq.
A. C. Pyrah, Esq.
A. J. W. Scopes, Esq.
County Councillor R. E. Sutton
(from 22nd September 1971)
County Councillor T. A. Thorpe
(to 30th April 1971)
County Alderman H. C. L. Warwick
(to 14th May 1971)

Water Conservation Committee

Lt. Col. the Hon P. E. Brassey, Chairman
County Alderman E. E. Wright, Vice Chairman

Councillor C. S. Bowering
L. H. Brown, Esq.
County Councillor J. R. Carr
County Councillor M. H. T. Carter
(from 22nd September 1971)
Alderman T. H. Cockerill
R. Edgley, Esq.
(from 22nd September 1971)

Alderman G. A. Foster
Alderman C. E. Goode
County Alderman Mrs. D. P. Oxenham
D. L. Parker, Esq.
T. R. Pick, Esq.
A. J. W. Scopes, Esq.
County Alderman H. C. L. Warwick
(to 14th May 1971)

Rutland Project Committee

Lt. Col. the Hon. P. E. Brassey, Chairman
L. H. Brown, Esq., Vice-Chairman

R. J. Berry, Esq.
Alderman T. H. Cockerill
(from 30th June 1971)
Alderman G. A. Foster
The Rt. Hon. the Earl of Gainsborough

T. R. Pick, Esq.
County Alderman H. Waltham
County Alderman H. C. L. Warwick
(to 14th May, 1971)
County Alderman E. E. Wright

STAFF

1. PRINCIPAL OFFICERS

Office	Name
Clerk of the Authority	.. D. S. Akroyd, LL.B., Solicitor
Chief Engineer	.. .. H. W. Clark, A.M.I.Struct.E., M.I.W.E. (on leave of absence from 31st December 1971) G. E. Bowyer, B.Sc., M.I.C.E., M.I.W.E. (Acting, from 1st January 1972)
Deputy Engineer	.. .. G. E. Bowyer, B.Sc., M.I.C.E., M.I.W.E. (to 31st December 1971) P. R. Langford, B.Sc., C.Eng., M.I.C.E., M.I.W.E. (from 20th March 1972)
Treasurer	.. .. A. E. Lane
Deputy Treasurer	.. .. J. A. Tindall, A.I.M.T.A., A.M.B.I.M.
Chief Fisheries and Pollution Prevention Officer	.. .. R. E. Field, A.M.Inst.W.P.C.

2. OTHER OFFICERS (as at 31st March, 1972)

Clerk's Department and General Administration

Chief Assistant	.. ..	Principal Officer 1
Clerical Assistant	.. ..	Clerical 3/4
Clerical Assistant	.. ..	Clerical 1
Field Officers (2)	.. ..	Misc. 6/8
Secretary	.. ..	Senior Scale B
Typists (9)	.. ..	Scale as appropriate
Telephonist	.. ..	Scale as appropriate

Chief Engineer's Department

Senior Engineers (4)	.. ..	Principal Officer 1
Divisional Engineers (3)	.. ..	Senior Officer
Engineer, Services	.. ..	Senior Officer
Senior Assistant Engineers (2)	.. ..	Senior Officer
Assistant Hydrologist	.. ..	AP 3/4
Chief Draughtsman	.. ..	T 7
Chief Clerk	.. ..	AP 3
Assistant Engineers and Technical Assistants (24)	.. ..	AP 1/5 or T 1/7 as appropriate
Secretary	.. ..	Senior Scale B
Clerks and Machine Operators (5)	.. ..	Clerical 1
Typists/General Clerk (3)	.. ..	Scale as appropriate

Treasurer's Department

Chief Assistant	.. ..	Senior Officer
Senior Assistants (2)	.. ..	AP 3/4
Clerical Assistants (9)	.. ..	Clerical 1/3 as appropriate

Fisheries and Pollution Prevention Department

Chemist	.. ..	Senior Officer
Assistant Chemist	.. ..	AP 4
Senior Assistant Inspector	.. ..	AP 5
Assistant Inspector	.. ..	T 4
Trainee Inspector	.. ..	T 3/4
Laboratory Assistants (3)	.. ..	T 1/2 as appropriate
Shorthand Typist	.. ..	Scale as appropriate

Non-established appointments

Chief Engineer's Department

Design Engineers (2)	.. ..	Senior Officer
Assistant Engineers/ Technical Assistants (4)	.. ..	AP 3/5 as appropriate
Draughtsmen (3)	.. ..	T 5/6 as appropriate
Junior Assistants (7)	.. ..	T 1
Clerk	Clerical 1

Treasurer's Department

Clerical Assistants (3)	Scales as appropriate
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3. WATER BAILIFFS

Water Bailiffs (2)	Misc. 4/5
Honorary Water Bailiffs (45)		

4. LABOUR FORCE (as at 31st March, 1972)

Tradesmen	.. ..	14
Foremen and Under Foremen	.. ..	28
Plant Drivers	.. ..	48
Storekeepers, Sluicekeepers, Tollkeepers, etc.	.. ..	8
Labourers	.. ..	84
		<hr/> 182

HAROLD WILLIAM CLARK

Harold Clark was given three months leave of absence from 31st December, and formally retired on the 7th April 1972.

After serving as a pupil with his father, an eminent Fenland Drainage Engineer, he was for a short time an Assistant with Glamorgan County Council, before being appointed at the age of 24 Chief Engineer of the River Nene Catchment Board on its establishment in June 1931. The Board was off the mark very quickly in spite of the financial restrictions then prevailing, and completed a major improvement scheme over the whole River by 1941. Photographs on page 44 illustrate the Nene as the Catchment Board found it, and the transformation which Harold Clark produced. The Catchment Board, although one of the smaller Boards, undertook more capital works than any other Catchment Board excepting one, and at substantially less cost than the post-war schemes carried out by other Boards.

He pioneered the installation of a river gauging and rainfall recording scheme in the later 1930s, anticipating subsequent legislation by nearly 20 years, and in the course of the Parliamentary Proceedings on the Empingham Bill it was said that the hydrometric data relating to the Nene was the best and most comprehensive for any river in the country.

The high standard of work carried out under his direction ensured that the Nene Area came through the 1947 floods extremely well, and it was recorded in the Ministry of Agriculture's publication "Harvest Home":

"The River Nene behaved particularly well though it carried a volume and intensity of flood water such as it had not experienced for a century at least. Much reinforcement and improvement had been done to its flood banks and all the new works stood the test of the great flood splendidly. There was no inundation of any consequence from the River Nene."

Again in 1953, the Nene Sea and Tidal defences, including two reclamation banks completed in the two previous years by Mr. Clark on behalf of the Crown Commissioners, withstood the exceptional flooding which inundated so much of the East Coast.

He was appointed Chief Engineer to the River Authority in 1965, and although essentially a Land Drainage engineer (coming from the Fens he claimed he had webbed feet) he almost immediately assumed responsibility for the technical planning of Empingham Reservoir, the largest project undertaken by any river authority. The data he had accumulated over the previous thirty years and the thorough planning and preparation carried out by his Department helped in no small way to ensure the success of the Bill when other Reservoir schemes were rejected.

His forty-one years as a Chief Engineer for the Nene Area, and more recently for the parallel and similar Welland Area, is indeed an exceptional record, and one that will never be exceeded. His knowledge of the Nene is unique, and his experience of Fenland drainage outstanding.

Harold Clark left with the best wishes of all members and of his colleagues for a long and well deserved retirement, and presentations were made to mark the occasion.

WATER RESOURCES

1. GENERAL REVIEW

Empingham Reservoir, the largest project undertaken by any River Authority and the biggest man made lake in England, continued to dominate the work of the Department, and will be referred to more fully below. Less spectacular, but none the less important hydrological and hydrometric work directed to the better understanding and control of the Area's water resources continued.

Following the discussions and planning of the previous year, practical steps were taken to implement the more urgent recommendations contained in the Water Resources Board's Report "The Groundwater Hydrology of the Lincolnshire Limestone" relating to the development of the Lincolnshire Limestone aquifer.

Discussions with the five other South East Central River Authorities, referred to in the Sixth Annual Report proceeded until the Department of the Environment published their proposals in Circular 92/71 for the Reorganisation of Water and Sewage Authorities, and it became apparent that any planning and co-ordination by SECRA would become the responsibility of Regional Water Authority No. 5 in 1974.

The staff have been involved in the Feasibility Study for the Wash Estuarial Storage Scheme, carrying out field work and contributing as members of the Working Party Study Group.

Close co-operation with the Water Resources Board continued, and their guidance and assistance is always appreciated.

2. PERIODIC SURVEY

Priority had still to be given to work on the Empingham Pumped Storage Project, and little progress was made on the First Periodic Survey. It is some years since the preparation of the Report was first put in hand, and much of the data originally assembled has since been revised, but it is hoped to publish an updated Survey in the coming year.

3. HYDROMETRIC SCHEMES

Expenditure to complete the First Hydrometric Scheme amounted to £11,583, bringing the aggregate to £92,371. The principal expenditure was on gauging stations, and three new structures were completed on the Holywell Brook, on Chesterton Brook, and on a tributary of the West Glen at Easton Wood.

Three magnetic tape recording raingauges and three electrical point gauges were purchased.

Improvements were made at Kates Bridge Gauging Station, where the weir was replaced by a flat-vee Crump type weir, and a similar weir was constructed at Easton Bridge. Improvements were also made at Shillingthorpe Gauging Station.

Difficulty in access made it impossible to collect information from the Flore Study Catchment, but it is hoped that agreements with the land owners concerned will be completed in the near future.

Four new rain gauging stations were established but four were discontinued. It is becoming increasingly difficult to recruit suitable voluntary observers for rain gauge stations, or to find suitable sites.

The Second Hydrometric Scheme was submitted to the Water Resources Board in May, and the total cost to 1975/76 was estimated at £56,340.

The principal expenditure is on improvements to the primary gauging stations to bring their measuring capacity up to a minimum of a 1 in 10 year flood discharge. In recent years the emphasis has been on measuring low flows for the purpose of water resources assessments, but an extension of the measuring capacity at selected stations will provide information for both water conservation and land drainage work.

4. INVESTIGATIONS OF WATER IN UNDERGROUND STRATA

(a) Lincolnshire Limestone

The more urgent recommendations contained in the Water Resources Board's Report on the Groundwater of the Lincolnshire Limestone were implemented.

A more thorough understanding of its hydrological characteristics is necessary if the limestone aquifer is to be operated and developed to the optimum, and at present there is insufficient data for effective planning and management.

Regular monthly observations of groundwater levels and chemistry were commenced in April, and with the exception of the area to the east of Spalding (where the predictions were somewhat conjectural due to lack of data) the levels compare closely with groundwater level contours as given in the Water Resources Board's Report. Chemical observations also showed close agreement, particularly in relation to the position of the fresh/saline water interface in the Spalding area. Regular observations clearly indicated a seasonal movement of the interface. Further observations will ultimately show whether or not there is a positive movement inland.

The Civil Engineering Department of the University of Birmingham is developing an electrical analogue model of the aquifer primarily based on the information contained in the Water Resources Board's Report, but the present more comprehensive field observations will enable refinements and corrections to be made. It took some time to adjust the model so that it would satisfactorily simulate ground water configurations found in the field. Subsequently tests to assess the effect on ground water levels of networks of abstraction at different rates were made. The work is continuing, and further refinements to improve the model are proposed.

Contractors began drilling in October on eight new observation boreholes. Five are sited in the outcrop area running approximately north to south from Old Somerby (near Grantham) to Wothorpe (near Stamford), while three are in the Spalding area close to the fresh/saline water interface.

(b) River Gravels

No further tests were carried out, but the following table shows the result of the Ditchford observations omitted from the previous Annual Report.

GROUND WATER—RIVER GRAVEL INVESTIGATIONS

Site	Grid Reference	Length of Test	Yield		Remarks
			m.g.d.	m ³ /day	
Ditchford	SP923677	7 days	0.15	680	Jetwell test carried out on behalf of Higham Ferrers and Rushden Water Board

5. MINIMUM ACCEPTABLE FLOW

No statutory minimum acceptable flow has been prescribed as required by section 19 of the Water Resources Act 1963 in view of the recognised difficulties, but a working "MAF" has been adopted as necessary.

6. RESEARCH AND EXPERIMENTAL WORK

Research and experimental work proceeding or in preparation is referred to under the appropriate headings.

7. LICENCES

(a) Abstraction Licences

The table on page 16 records the Licences of Right (with some variations) extant at 31st March.

Twenty-three Licences of Right, eleven being for spray irrigation, were revoked at the request of the Licence Holders. This represents a considerable reduction on the figures of the previous two years, and it would appear that the authorised quantities for spray irrigation licences have become more realistic. In addition to the eleven spray irrigation licences surrendered, a further three were reduced by an aggregate of less than 3 million gallons.

Where licences are surrendered, or where the authorised quantities are reduced, licence holders are reminded that they cannot obtain a new licence, nor revert to the previous higher authorised quantity, at short notice in the event of a drought.

One Licence of Right lapsed, and twenty-three licences were transferred to new occupiers.

Eight licences, inclusive of the three spray irrigation licences referred to above, were reduced in quantity, but the decrease in authorised quantities was not significant, and resulted from the reorganisation of sources by Statutory Water Undertakers and a re-appraisal of current demand.

Six applications for new Licences were received, and six licences were issued in appropriate terms. One was a licence limited to 15 million gallons required by contractors for the hydraulic testing of a new trunk gas main.

Two applications for variations of licences other than in respect of the authorised quantity were granted.

The net effect of revocations, variations, and new licences is an increase in the aggregate abstraction of 11,738 thousand gallons per annum.

The tables on page 17 shew the Licences not of Right issued during the year and those extant at 31st March.

(b) Impounding Licences

No applications for impounding Licences have been received.

8. CONSERVATION WORKS

Empingham Reservoir

(Note: In the Annual Reports for the past three years it has been the practice to record the important parliamentary and planning contingency stages which had been passed at the date the Report was prepared, but as the work is now proceeding according to plan the normal practice of reporting as at the 31st March is reverted to.)

The Normanton section of the Edith Weston-Empingham Road was opened to traffic on 1st August, so that Sykes Lane from Empingham to Bull Bridge could be closed to the public leaving it free for the Contractors.

The contract for the River Diversion Tunnels and Shafts was completed by Edmund Nuttall Ltd. on 23rd December, and work on the dam could then proceed; the main contractors, Gleeson Civil Engineering Ltd. having moved on to the site for preparatory work on the 8th September.

The main contractors made a very impressive start in removing the alluvium from the floor of the valley, while the sub-contractors, Soil Mechanics Ltd., drilled and back filled some 10,700