



NORFOLK AND SUFFOLK

LOCAL FLOOD DEFENCE COMMITTEE

ANNUAL REPORT 1996/97



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In accordance with Section 17 of the Environment Act 1995, the report on flood defence works carried out during the year 1996/97 in the Norfolk and Suffolk Local Flood Defence District is presented herewith, together with a summary of the accounts for that year.

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NORFOLK AND SUFFOLK LOCAL FLOOD DEFENCE DISTRICT



The aim of the Flood Defence function is to provide effective defence for people and property against flooding from rivers and the sea, and to provide timely warning systems such that effective actions can be taken to minimise the impact of flooding. This will be achieved by undertaking works that are technically sound, economically justifiable and environmentally acceptable.

PRINCIPAL STATISTICS

Total Length of Main River	1332 km
Total Length of Tidal Main River Defences	217 km
Total Length of Estuary Defences	107 km
Total Length of First Line Sea Defences (Environment Agency responsibility)	102 km
Total Length of Fluvial Main River (to MAFF demarcation point)	1097 km
Area of Local Flood Defence District	5329 km ²
Number of Internal Drainage Boards	36
Total Area of Internal Drainage Districts	584 km ²
Number in Workforce:	
Approved Emergency Workforce "core" number	62
Actual number during year	57

NORFOLK & SUFFOLK LOCAL FLOOD DEFENCE COMMITTEE MEMBERSHIP

CHAIRMAN

Sir Edward Greenwell Bt, DL
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Gedgrave Hall
Woodbridge IP12 2BX

Mr. N.G. Chapman
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APPOINTED BY THE REGIONAL FLOOD DEFENCE COMMITTEE

Mr. D.C. Adams
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Mr. D.C. Holland
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Norwich NR13 6HE

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Laurel Farm
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Mr. D.L. Ritchie
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Ms J. Hore (from 27.1.97)
16 Victoria Road
Oulton Broad
Lowestoft NR33 9LH

Mr. J. Sharpe
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Norwich NR2 3HG

Mr. P.D. Monk
The Old Star Inn, The Street
Bawdsey
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APPOINTED BY THE CONSTITUENT COUNCILS

Norfolk County Council:

Mr. P. Baldwin
Rowan Cottage, The Street
Dilham
North Walsham NR28 9PS

Mr. M.V. Castle
27 Beaconsfield Road
Great Yarmouth NR30 4JN

OBSERVERS

Mrs. S.V. Ashford (Norfolk & Suffolk Catchment Panel/
Holly Lodge Area Environment Group)
Strumpshaw
Norwich NR13 4NS

Mr. S.E. Alden (Regional Fisheries Advisory Committee)
19 Mariners Lane
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OFFICERS SERVICING THE COMMITTEE

Area Manager (Eastern) Paul Foster

Area Flood Defence Manager

John Hesp

Regional Finance Manager Ian Ripley

Regional Flood Defence Manager

Steve Wheatley

Operations Engineer Mick Whiley

Catchment Engineer

Stan Jeavons

AREA MANAGER'S REPORT

This is the first annual flood defence report and accounts under the auspices of the Environment Agency summarising the works undertaken during 1996/97 in the Norfolk and Suffolk Local Flood Defence District. On 1 April 1996 the National Rivers Authority was succeeded by the Environment Agency, which took over the NRA's flood defence role with a fundamentally unchanged operating structure.

The Eastern Area of the Environment Agency Anglian Region comprises Norfolk, Suffolk and Essex. The Area is an operational unit, headed by the Area Manager, who is a member of the Regional Management Team. Its structure is based on integrated catchment management to enhance the effectiveness of the efficient delivery of services across all Agency functions at Area level. Flood Defence personnel are split into client and contractor groups in recognition of the need to apply market testing to Agency operations in order to demonstrate its ability to provide value for money. The client group is headed by the Area Flood Defence Manager supported in Norfolk and Suffolk by a Catchment Engineer. The Emergency Workforce and supervisory staff are headed by the Area Direct Services Manager.

The Ministry of Agriculture, Fisheries and Food for the sixth year in succession granted the Norfolk and Suffolk Local Flood Defence Committee an enhanced rate of grant in recognition of the continuing urgent need to upgrade flood defence standards in Norfolk and Suffolk. The major scheme to combat the severe erosion problems on the vulnerable Happisburgh to Winterton frontage continued during 1996/97 to account for the majority of the Committee's capital expenditure. It had been resolved the previous year that this scheme should receive absolute priority in view of its importance in avoiding outflanking the Norfolk Broads, and consequently Broadland schemes were deferred. Following a 10% increase in the flood defence levy last year, the Norfolk and Suffolk County Councils recognised the necessity to continue a high level of funding and approved a 15% increase in the levy for 1997/98 (with the proviso that some £2 million of this be allocated to urgent Broadland schemes). The Ministry responded to this signal of local commitment by increasing the grant earning ceiling for 1996/97 from £6.5 million to £17 million, which allowed Stage 2 of the Happisburgh to Winterton Sea Defences to be substantially completed. It is now three years since submission to the Ministry of the £57 million Broadland Flood Alleviation Strategy, which was subsequently increased to £63 million to provide protection to the previously undefended areas. The Strategy is currently being considered as to its suitability for Private Finance Initiative, and formal Treasury approval awaits the outcome of this examination.

By Ministerial Direction, the Environment Agency took the lead role in the dissemination of flood warnings on 1 September 1996. This new responsibility has involved considerable planning and is expensive in terms of both financial and personnel resources. The project is funded by the Local Flood Defence Committee. Norfolk is unique in that the Police have opted to continue to disseminate both tidal and fluvial warnings based on information supplied by the Agency. In Suffolk all flood warnings are now issued by the Agency.

There have been some changes in the membership of the Norfolk and Suffolk Local Flood Defence Committee during the year under review. It is reported with deep regret that Mr. Jack Haylock MBE died in January 1997, having been a member of the Committee for eight years as a representative of Suffolk County Council. Ms J. Hore has been appointed to his seat on the LFDC. Following the resignation of Mrs. K.M. Rogers from the Committee, Norfolk County Council appointed Mr. P. Baldwin as her replacement.

PAUL R. FOSTER
AREA MANAGER (EASTERN)

OPERATIONS REPORT - 1996/97

CAPITAL WORKS 1996/97

The Norfolk and Suffolk Local Flood Defence Committee's allocation from Anglian Region's Grant Earning Ceiling for 1996/97 was £17 million.

The basic rate of grant from the Ministry of Agriculture, Fisheries and Food was 55%, with a 20% supplement for tidal and sea defence works. The final out-turn figures for capital expenditure were:-

	1996/97 £K
Grant eligible work	17,019
Non grant eligible work	202
Salaries and consultants' fees	1,232
Total	18,453

A schedule showing this expenditure split down scheme-by-scheme is included in the financial summary at the end of this report.

The programme was again dominated by high priority sea and tidal defence schemes, the most significant of which are briefly described below:-

1. FRONTAL SEA DEFENCES

Happisburgh to Winterton Sea Defences

- (a) Emergency Beach Recharge - Sea Palling
Scheme No. MTB41317 Expenditure 1996/97 - £818,000

The serious threat to the integrity of the sea defences at Sea Palling caused by beach scour during the 1995/96 winter necessitated emergency beach recharge to secure the stability of the sea wall. A contract awarded to HAM Dredging Ltd. for pumping ashore 300,000 cubic metres of sand was successfully completed at the very start of the year under report.

- (b) Happisburgh to Winterton Stage 2
Scheme No. MTB41308 Expenditure 1996/97 - £14,573,000

Following a review of the performance of the first four reefs, including an independent assessment by Delft Hydraulics, a revised strategy for the improvement of the sea defences was produced by Sir William Halcrow & Partners. This report identified areas for refinement which were incorporated in the recommended future

HAPPISBURGH TO WINTERTON SEA DEFENCES

ROCK SUPPLY



Quarrying rock in Norway



Landing rock for beach works

HAPPISBURGH TO WINTERTON SEA DEFENCES

REEF CONSTRUCTION



Making geotextile fascine mattress on the beach before floating and placement



Side-dumping vessel "*Avelingen*" placing bedrock to weigh down fascine mattress

HAPPISBURGH TO WINTERTON SEA DEFENCES



Beach Recharge in progress at Sea Palling

works programme. An updated Environmental Statement was produced and concluded that there would be no significant detrimental environmental impacts resulting from the execution of the works.

Subsequent to the Ministry of Agriculture, Fisheries and Food agreeing to the revised strategy, a contract for Stage 2 was awarded to Van Oord ACZ Ltd. in the sum of £18.6 million. This contract comprises the construction of a further five offshore reefs, placing approximately 1,000,000 cubic metres of beach recharge material and the siting of land-based windrows between the existing reefs.

The works commenced in September 1996 and the contract completion date is in December 1997. Construction was planned to be carried out over two summers. However, Van Oord have made excellent progress by choosing to continue to work throughout the winter months. Works completed to the end of March included all five rock armour reefs (215,000 tonnes). The land based windrows and 950,000 cubic metres of beach recharge material has been placed behind the existing and newly constructed reefs.

The remaining work to be carried out under Stage 2 comprises the installation of reef marker beacons and completion of the beach recharge immediately to the south of the new reefs.

A strategic monitoring programme has been developed and is being implemented to monitor the physical and environmental effects of the overall scheme as it progresses.

Bawdsey - East Lane Sea Defences

Scheme No. MTB40323

Expenditure 1996/97 - £477,000

Emergency rock armour protection works commenced at East Lane on 9 October 1996. The works were being carried out by J. Breheny Contractors Ltd., and initially comprised the placing of approximately 10,500 tonnes of rock armour around the dilapidated promontory and along the exposed toe of the clay embankment situated on the lower cliffs to the south.

During the execution of the works the foreshore fronting the northern section of the promontory suffered further erosion and the lower shallow sloped revetment collapsed leaving the upper section of the concrete sea wall exposed to undermining. A Variation Order has been placed with the contractor to provide an additional 4,500 tonnes of armour to secure the defence at this location.

Also during the course of the contract, additional works were carried out by the Environment Agency on behalf of Suffolk Coastal District Council to extend the rock armour profile southwards to provide coast protection fronting the martello tower. The cost of these works is not included in the above.



BAWDSEY - EAST LANE SEA DEFENCES

Aerial view showing rock armour protection to Promontory (centre) and to Martello Tower (foreground)

BAWDSEY - EAST LANE SEA DEFENCES

NORTHERN SECTION OF PROMONTORY



Damage to lower revetment - October 1996



Scour hole behind sea wall - October 1996

BAWDSEY - EAST LANE SEA DEFENCES



Erosion before and after placing rock armour protection



2. TIDAL RIVER DEFENCES

Broadland Flood Alleviation Strategy

The preparation of schemes has continued so that work can proceed without delay when approval for the Strategy is received. Prior to the publication of Local Environmental Assessments for Compartments 11, 22 and 36, all potentially affected landowners were invited to a briefing held at Caistor Hall near Norwich. Most of the key landowners attended and had the opportunity to learn about the proposals and discuss issues with all project team members, including the consultants working on the project. The three Local Environmental Assessments have now been published and work on detailed scheme proposals is under way.

Broadland Compartment 22 (Phase 1)

River Yare/Haddiscoe Cut Confluence

Scheme No. MTB40506

Expenditure 1996/97 - £246,000

A contract for 190 metres of low level piling on the south west bank of the River Yare near Reedham was awarded to the Direct Services Group. Work commenced in February 1997 and is due for completion in June 1997. The tender value is £400,000.

Great Yarmouth Flood Defences - ABC Wharf

Scheme No. MTB41410

Expenditure 1996/97 - £150,000

Re-piling work is being carried out to George Prior's Quay at a total cost of £600,000, to which the Norfolk and Suffolk Local Flood Defence Committee will make a 50% contribution. The balance of the contribution will be paid upon completion of the work, which is programmed for May 1997.

3. SHORELINE MANAGEMENT PLANS

The aim of a Shoreline Management Plan is to provide the basis for sustainable coastal defence policies within a sediment cell and to set objectives for the future management of the shoreline.

Norfolk and Suffolk Shoreline Strategy

Shoreline Management Plans have been prepared covering the Norfolk coastline from Snettisham to Sheringham (Subcell 3A) and Sheringham to Lowestoft (Subcell 3B) and the Suffolk coastline from Lowestoft to Harwich (Subcell 3C). This work was undertaken in co-operation with the relevant maritime district councils. To date the Norfolk and Suffolk Local Flood Defence Committee has adopted Plans 3A and 3B relating to the Norfolk coastline.

Suffolk Estuary Strategy

In addition a Shoreline Management Plan will be produced for the Suffolk Estuaries.

BROADLAND

**RIVER YARE /
HADDISCOE CUT
CONFLUENCE**

Right: Eroding bank

Below:

**Work in progress showing
Low level piles and
stockpiled reed rhizomes**



MAINTENANCE AND EMERGENCY WORKS 1996/97

Introduction

In 1996/97 the Norfolk and Suffolk Catchment prepared and completed a programme of maintenance works to the value of £2,287,000, approximately 20% of which was competitively tendered, the balance being awarded to the Environment Agency's Direct Services Group.

In addition to the planned and routine maintenance works carried out on the 1500km of Main River and 410km of sea and estuary defences in the Catchment, the following factors have influenced the programme of works and expenditure:

- The increasing expenditure necessary on the deteriorating tidal floodbanks in Broadland, ahead of capital expenditure under the Broadland Flood Alleviation Strategy.
- The deteriorating condition of the rural Suffolk estuaries flood defences, particularly at Trimley and Shotley.
- Drought conditions and low flows leading to increased deposition of silt and invasive vegetation growth in the freshwater river system.
- The continuing need to prioritise maintenance works to protect people and property affected by previous flooding events.
- The ongoing repair works necessary on sea defence frontages, due to the February 1996 event, particularly at Holme, Brancaster, Salthouse and Bawdsey.

These factors have largely been dealt with within the resources available to the Catchment in this financial year. However, the delay in implementing schemes within the Broadland Flood Alleviation Strategy will require the continued use of additional revenue resources throughout Broadland for essential repair and maintenance works to the existing defences in the foreseeable future.

Approximately 75% of the total maintenance budget was allocated to individually identified and planned revenue jobs, whilst the remaining 25% were expended on emergency events and tasks of an unplanned nature. The total maintenance expenditure during 1996/97 (with the previous year's figures for comparison purposes) was:-

	1995/96 £K	1996/97 £K
Maintenance of Sea and Tidal River Defences	1,240	1,525
Maintenance of Inland Waters	851	762
Total	2,091	2,287

The revenue expenditure for 1996/97 again included an additional 2.5 % granted by the Local Flood Defence Committee to assist in meeting the increased revenue costs of maintaining our deteriorating assets. The budget target was met within 0.5% including emergency and contingency items.

The use of external contractors continues to complement the service provided by our in-house team, particularly where the supply of specialist equipment, plant and resources are required and where external contractors have been successful in winning competitive contracts.

The Catchment Engineer manages the tidal and fluvial resources in the two counties with a staff of 12, based at Norwich and Ipswich. A pivotal role of the Catchment Engineer and his staff continues to be the ongoing liaison and consultation with riparian landowners and frontagers, public authorities and private organisations, and increasingly developing relationships with statutory environmental bodies and conservation organisations. Requests for talks and presentations to schools, colleges, clubs and special interest groups continues to increase as the issues relating to flood defence are included in school curricula and debated in the media. Senior Catchment staff continue to be called to give interviews on radio, television and with the press, especially during an emergency event. Flood defence matters are routinely dealt with by telephone and in writing and by attending site meetings. Requests to attend public meetings with locally elected representatives, district and county councils reflect a growing public requirement for accountability. Catchment staff again manned the Environment Agency stand at both the Norfolk and Suffolk Shows in 1996. The integration of Waste Regulation colleagues at the Norwich Catchment Office is complete and opportunities for increased liaison and co-operation with other functions is an ongoing commitment. Liaison meetings continue with the Norfolk and Suffolk Constabularies and other emergency services to discuss emergency procedures, liaison and co-ordination during tidal and fluvial events. The role of the Environment Agency in issuing flood warnings is currently confined to Suffolk, with the Norfolk Constabulary still retaining their former responsibilities in the lead role for issuing warnings.

The following report describes some of the revenue works undertaken in the Catchment in the past year, and identifies the expenditure incurred on maintenance activities.

Sea Defence Works

General

The sea defence frontage for the Norfolk and Suffolk Local Flood Defence Committee extends from Old Hunstanton in West Norfolk, along the Suffolk frontage to Shotley near the Essex border. The 102km of defences range from hard steel and concrete floodwalls to softer frontages of shingle bank and sand dunes. These softer natural defences are particularly vulnerable to aggressive winter storm damage requiring ongoing and frequent maintenance to ensure the continuing integrity of these frontages. Shingle beaches are especially vulnerable to wave and tidal action and the shingle bank defences at Cley to Salhouse, Easton Broad, Walberswick to Dunwich and Sudbourne Beach, protecting property, agricultural land and areas of internationally important nature reserves, have all required significant repairs following tidal damage.

Holme-next-the-Sea

The sea defences are formed by sand dunes which have been eroding at a rate of between 5-10 metres per year. This has now extended over approximately 500 metres of the frontage. Within the area protected by these defences are 40 properties, agricultural land and the Holme Reserve which is managed by the Norfolk Wildlife Trust. This site is of environmental importance for its dune system and freshwater marshes resulting in SSSI, Ramsar Site, Special Protection Area and Biosphere Reserve designations.

The North Norfolk Shoreline Management Plan recommends that the property is protected in the short term by strengthening the eroding dune system. This would have to be by a construction which was environmentally and financially acceptable. A detailed appraisal and environmental assessment has been suspended until suitable options can be found. One proposal which is hoped to meet this criteria is the Beach Management System (BMS), and a twelve week trial is currently under way at this site to evaluate its potential. The theory behind this system is that it operates by draining and hence stabilising the beach by encouraging sand material in suspension to be deposited, eventually building up the foreshore. A coastal processes study is also under way to assess the long term trends and effects of any works on adjacent frontages.

Subject to a successful conclusion, works for this frontage may take place in 1998/99.

Brancaster

The reduction in beach levels along the northern flank of the existing defences at Brancaster have resulted in the deterioration of the revetment and its long term suitability is in question. To protect the two isolated properties to the north of Brancaster village, a small ring bank is proposed, to be constructed in the summer of 1997. Currently investigations are continuing on the preferred option for the future defence or otherwise of Brancaster West Bank, and consultants' reports on the environmental and hydrodynamic impacts of options are being prepared. In the interim, emergency repairs have been successful in maintaining the existing frontage.

Cley to Salthouse

The 5km of managed shingle bank protecting people, property and internationally important environmental freshwater marshes between Cley and Salthouse was extensively damaged in February 1996. Extensive beach re-profiling works are now complete and the bank profile has been reinstated. However, the ever present vulnerability of the protected area is recognised, and consultants are currently investigating the economic and environmental options for protecting this frontage.

Happisburgh to Winterton

The completion of Phase 2 of the scheme, which has included the construction of a further five reefs and the recharging with one million cubic metres of sand on the foreshore at Sea Palling, has encouraged the continuing build up of beach material within the area of influence of the reefs. Revenue maintenance works continue on the vulnerable 60 steel and timber groynes between Happisburgh and Winterton.

BEACH MANAGEMENT TRIAL - HOLME-NEXT-THE-SEA



Installation of pumping sump
(see page 10)



Test pumping at outfall pipe on low tide

MAINTENANCE WORKS

RIVER ANT - LUDHAM BRIDGE



Competitively tendered works to replace defective revetment piling.
Installation of piles using floating plant



Completed works showing low level piles and amenity sensitive timber capping

EMERGENCY WORKS

RIVER YARE -
HARDLEY CROSS

Right:

Failure of heavyweight piling
protecting flood bank

Below:

Piling failure and
progressive floodbank
failure prior to
emergency works



Bawdsey

Following storm damage and the immediate risk of failure to this defence frontage, an emergency capital scheme contract was awarded to J. Breheny Contractors Ltd. in October 1996. This comprised imported rock to protect the existing hard defences and the clay embankment to the south. During the contract a variation was approved to extend the rock armouring northwards following further damage. Suffolk Coastal District Council agreed to fund additional works extending the rock work southwards to protect the cliffs fronting the Martello Tower.

The scheme has been successfully completed, involving the placing of 15,000 tonnes of rock.

Tidal Banks and Embankments

Broadland

The condition of the 240km of tidal floodbanks throughout Broadland and 67km of tidal estuary floodbanks in Suffolk along the Alde, Deben and Orwell estuaries, continues to worsen. In Broadland annual settlement of up to 20mm, boat wash and impact damage, leaks and tidal scour all contribute to the need for essential maintenance. Ahead of the Broadland Flood Alleviation Strategy, ongoing maintenance and emergency works are proceeding and additional resources continue to be targeted into Broadland. This revenue work is intended to reduce the accelerated rate of defence deterioration by targeted works and pre-planned maintenance and repairs, to prevent as far as possible the risk of total failure of a tidal bank. The protection of Halvergate continues to be a major concern, whilst work continues along Haddiscoe Cut to protect the Burgh Norton compartment. Emergency failure piling along Haddiscoe Cut and at Langley have required pile replacement works to sustain the defence line.

Suffolk

In Suffolk, repairs to existing rural tidal floodbanks continue, but these works do not match the worsening condition of the Suffolk estuaries floodbanks. A previous repair at Reydon Wall on the River Blyth has been strengthened using soft engineering techniques including geotextiles and brushwood faggots. The existing floodbanks protecting the Trimley and Shotley frontages on the Orwell estuary continue to give concern, and a full environmental, economic and hydrodynamic investigation is being carried out to determine the sustainable options for these defences.

All the tidal defences are inspected annually as part of our ongoing monitoring programme and following a major tidal event. The resulting report and routine frontage inspections assist in the preparation of the Catchment's prioritised revenue and capital programme.

Structures

Throughout the Catchment there are more than 450 structures on fluvial and tidal rivers and floodbanks, and incorporated into sea defences, that require operating, maintaining, repair and eventual replacement. The ongoing commitment to meet the operating needs of these

structures, whilst complying with current health and safety legislation, requires considerable revenue expenditure. Every significant structure has an operating and maintenance document, and all structures receive safety and maintenance inspections in addition to independent safety audits. Structures that are required to be operated during an emergency, such as floodgates, are regularly tested and receive enhanced levels of inspection and maintenance. Some significant works were:

- Cley Defence Outfall Sluice: This new structure, constructed as part of the recent capital scheme to protect the village of Cley against tidal flooding, has been subsequently improved to provide automatic closure of the pointing gates. This is an additional safety measure in the unlikely event that operatives are unable to reach the site. In addition, a tidal gauge has been incorporated into the new telemetry system and complements the existing tidal stations at Wells and Cromer.
- River Burn Outfall Sluice: The refurbishment of this structure has included the provision of new pointing doors, concrete base and an upstream penstock. The works will give improved operation, the opportunity to manage upstream water levels and reduce the amount of saline intrusion. The structure was originally constructed in 1822, 174 years ago, and the dated headstone has been retained on what must be one of our oldest assets.
- Gapton Hall Penstocks, Great Yarmouth: These four structures protect the town against flooding in the event of any failure of South Breydon defences. They have been refurbished following vandalism and upgraded to provide quicker operation in an emergency.
- Wainford Sluice, River Waveney: A minor capital scheme is under way to replace the existing hand-operated vertical lift gate, which is at the end of its useful life, with an automatically controlled tilting gate.
- Acle Landspring Outfall: This redundant gravity outfall has been demolished in a scheme incorporating the rebuilding of the associated roadway and installation of erosion protection and safety works.

Fluvial Embankments

There are approximately 60km of flood embankments on freshwater sections of Main River in the Catchment, usually above milling heads, where the original function was to impound the river. Routine maintenance continues as required, with selected lengths requiring cutting, leakage repairs and reinstatement works to maintain flood defence standards. Private mill owners are encouraged to manage their water levels sensitively, to prevent either overtopping or drying out of the embankments. Drought conditions lead to lower retained water levels and drying banks, which increases maintenance costs. Following the designation of the River Wensum as an SSSI, a Water Level Management Plan is being prepared which will recognise the significant length of embankment and water retained frontages.

Pumping Stations

There are three major pumping stations in the Catchment, at Acle, Benacre and Hollesley. In addition, the Catchment administers an Internal Drainage Board pump at Reydon. Reduced river flows have again led to lower power costs in this financial year.

- Hollesley Pumping Station: The 16 inch pump was removed for inspection and refurbishment whilst a standby Internal Drainage Board pump maintained any pumping needs. However, further maintenance works are required on the structure controls to meet health and safety requirements and future operational needs. A scheme in the capital programme to rebuild the station has been delayed until 1998/99.
- Acle Pumping Station: No major problems were encountered during 1996/97. A Water Level Management Plan is being prepared to incorporate the stations's operation.
- Benacre Pumping Station: The automated station and weed cleaner continue to work satisfactorily, albeit under light loading.
- Reydon Pump: This floating structure continues to require significant maintenance involvement to ensure its continuing operation.

Weed Control

The Direct Services Group were again successful in 1996 in winning the competitively tendered weedcutting contract for major river systems in Norfolk and Suffolk, against external contractors. Using a combination of weedboats, hydraulic machines with grasscutting buckets, flail and pedestrian mowers, and some essential hand cutting, the majority of major watercourses were cut, either once or twice, dependent on need and status of protected area.

Previous freshwater flooding events have highlighted the need to target weedcutting, especially on frontages where properties had flooded. On smaller watercourses, especially in Suffolk, this work is still carried out by hand because of difficulties with machine access and the need to preserve our environmental standards.

The timing and extent of weedcutting is discussed with our environmental and fisheries colleagues, particularly on sensitive sections of rivers where fish spawning areas exist. Increasingly, external environmental and fishing organisations influence the weedcutting regime and a balanced decision is required to maintain an effective flood channel whilst protecting conservation interests.

Low summer flows in 1996 increased the amount of aquatic weed growth and encouraged invasion of the watercourse by terrestrial species. The cutting programme is balanced to provide for sudden summer flooding, whilst retaining sufficient weed growth to hold up water levels in the channel.

MAINTENANCE WORKS



River Deben at Martlesham. Repairs to floodbank revetment using open-core blockwork. Topsoil being placed to promote grass growth.



River Waveney - Chainbridge Beck
Desilting works following minimum environmental standards

MAINTENANCE WORKS



Darsham Marshes - Reinstatement of conservation pond
as part of routine river maintenance works on Suffolk Wildlife Trust's Reserve.



Desilting works on Darsham Marshes

Dredging and Desilting

The programme for fluvial river works has again been driven by previous flooding events, requests from landowners, frontagers and local authorities, and site inspections by staff. In Suffolk, where the watercourses tend to be more reactive and carry a higher silt load, remedial works have been focused on sections of Main River where urban areas have flooded and where maintenance standards in the past have been lower.

Prior to any work commencing, comprehensive liaison is undertaken with all interested parties and comments sought from our conservation staff. Where revenue maintenance works are considered insufficient to meet the flood risks, an engineering and environmental appraisal is carried out on the watercourse for a possible sympathetic channel improvement, flood routing or flood storage scheme.

As a result of the unseasonal low flows in fluvial rivers, lower winter retained levels were again not set at all sluices, in order to protect fisheries stock and the aquatic environment, commensurate with flood defence needs.

Clearance of Obstructions

There is a continuing need for sensible channel maintenance and the clearance of channel obstructions, weedscreens at pumping stations and sluices, and debris around bridges and structures. Following a major fluvial event, all main rivers in the Catchment are patrolled, obstructions removed and landowners advised about fallen trees. In addition, all sluices and structures are regularly visited to remove debris that can reduce the effectiveness of the controls and increase the flood risk.

The Operation of the automatic weedscreen at Benacre Pump continues to give lower operating costs, although the initial capital investment was high.

Incidents continue to be reported of shopping trolleys and other debris in the urban river lengths, the problem being worse through dense urban areas such as Norwich and Ipswich.

The opportunity is always taken to remind landowners and local parish councils of our Freephone telephone number (0800 - 80 70 60). They are encouraged to advise Catchment staff of any river problems, as additional "eyes and ears" on the ground allow us to target our limited resources more effectively. Our staff continue to develop this local liaison and relationships which encourage the "partnership" approach to flood defence needs and promote the sense of local ownership of a problem.

Some Key Events in the Year

- | | | | |
|------------|---|---|---|
| April 1996 | - | <u>Birth of the Environment Agency:</u> | On 1 April 1996 Flood Defence staff transferred into the new Environment Agency, which came into being on 1 April 1996. |
| May 1996 | - | <u>Salthouse Shingle Bank:</u> | On 4/5 May 1996 tidal flooding took place to the marshes at Salthouse due to the overtopping |

of the shingle defences caused by a strong northerly wind on a high tide. No properties were affected and the armoured Army bulldozers carried out a temporary repair.

- June 1996 - The North Norfolk Local Environment Agency Plan was presented at the launch of the consultation period to an invited audience at Blakeney.
- September 1996 - The Norfolk & Suffolk Local Flood Defence Committee held their Annual Inspection of Works in Norfolk. Members and guests inspected the frontage at Sea Palling and in the afternoon took a river trip in Broadland covering Breydon Water, Berney Arms and Reedham, all schemes proposed under the Broadland Flood Alleviation Strategy.
- November 1996 - Great Yarmouth: A flood defence wall collapsed, threatening built up areas of Yarmouth protected by the defence. Emergency bund walls were installed and permanent works to reinstate the defence subsequently undertaken.
- November 1996 - Broadland: A piling failure occurred on the Haddiscoe Island side of the Cut with damage extending up to 100 metres. An emergency reinstatement scheme was carried out by the Direct Services Group.
- December 1996 - Sea Palling: A Lowestoft fishing boat sank after colliding with a floating discharge pipe, and a rock laden 4,500 tonne barge broke its anchors in a sudden sea swell and was swept on to the beach. No one was hurt in either incident.
- January 1997 - Flood Defence Levy: Norfolk and Suffolk County Councils agreed a 15% increase in the flood defence levy for 1997/98 to allow continued acceleration of urgent capital works.
- February 1997 - Broadland: A failure of heavyweight piling occurred on the River Yare at Hardley involving 25 metres of defence. Emergency works were designed by the Catchment and implemented by the Direct Services Group.
- March 1997 - Happisburgh to Winterton Flood Defences Phase 2 Contract: Thanks to a particularly good partnership arrangement between the Environment Agency, its consultants, Halcrows, and contractors, Van Oord ACZ, and with the benefit of generally favourable winter weather conditions, Phase 2 of the scheme, which included the construction of 5 rock shore-parallel reefs and the placing of one million cubic metres of sand to recharge the beach, has been successfully completed six months ahead of programme.

Summary of Revenue Maintenance Expenditure

The Norfolk and Suffolk Catchment, in carrying out its revenue expenditure approved by the Local Flood Defence Committee, continues to endeavour to provide value for money within the Authority's financial regulations, whilst achieving a quality level of service and emergency response. The competitive tendering of an increasing percentage of the workload, the requirement for the Direct Services Group to price all awarded work and the competitive tendering for all equipment and services helps to demonstrate our commitment to providing the best possible service for the most economic price. The 1996/97 actual expenditure under the various task headings for the Catchment is given below.

-	Sea Defence Works: general maintenance and repairs to 102km of defences.	£	744,378
-	Tidal Banks and Embankments: grass cutting, clearance, damage repairs and revetment replacement to 224km of defences.	£	711,862
-	Structures: routine maintenance, repair and operation of approx. 450 major structures.	£	172,809
-	Fluvial Embankments: the routine maintenance and repair of 60km of non tidal defences.	£	86,635
-	Pumping Stations: the operation, maintenance and power supply to three stations.	£	38,191
-	Weed Control: the cutting and removal of aquatic growth within fluvial main rivers.	£	116,750
-	Dredging and Desilting: removal of silt and vegetation along identified lengths of fluvial main river.	£	125,334
-	Clearance of Obstructions: the removal of debris and obstruction along the whole of the main river system, particularly at bridges and control structures.	£	196,184
-	Emergency Works: the efficient, effective and prompt monitoring of the risk of flooding throughout the Catchment.	£	94,857
			<hr/>
			<u>£ 2,287,000</u>

CONSERVATION AND FLOOD DEFENCE

The Norfolk and Suffolk Local Flood Defence Committee has always recognised the effects that many of its works could have on the environment and has taken into account the need to conserve. Before any capital or revenue works are carried out there is full consultation with the conservation interests. Environmental surveys are undertaken and, in the case of major capital schemes, an Environmental Assessment. In addition, Section 7 of the Environment Act 1995 places a positive duty of conservation enhancement upon the Environment Agency: this policy is pursued whenever possible. Agency personnel involved in works are constantly alert to take advantage of unexpected opportunities that often present themselves when plant and workforce are in a particular area, assisted by close links with their conservation colleagues. Also, upon request, conservation works have been undertaken on a rechargeable basis, using our specialist skills, e.g. for the RSPB and the Broads Authority, when the works cannot be justifiably charged wholly to flood defence funds.

The majority of the coast in Norfolk and Suffolk is covered by a range of statutory and non-statutory designations which recognise its national and international environmental importance. There are two statutory designations/directives that recognise the international conservation importance of natural habitats -

- Special Protection Areas (SPA) designated under the European Community Birds Directive for the value of wildfowl and waders.
- Special Areas of Conservation (SAC) designated under the Habitats Directive for the habitats and species value of the area.

Other designations include -

- Sites of Special Scientific Interest (SSSI)
- Areas of Outstanding Natural Beauty (AONB)
- National Nature Reserves (NNR)
- The Broads Authority Environmentally Sensitive Area (ESA)
- Local Nature Reserves (LNR)
- County Wildlife Sites

The need to ensure full liaison and agreement with all consultees prior to working within their designated areas involves a significant but necessary workload and satisfactory forward planning.

The Catchment staff continue to be involved in initiatives to enhance the environment whilst carrying out flood defence works. The following merit particular attention:-

- Burnham Overy Staithe: Whilst carrying out essential maintenance works to the flood bank crest at Burnham Overy, the opportunity was taken to counteract pedestrian erosion. These works have improved pedestrian and wheelchair access along the seabank, which forms part of the Norfolk Coast Footpath.
- Acle Landspring: A temporary weir has been installed by flood defence staff

under the recommendations of English Nature to prevent sewage treatment works outfall water flowing back to an SSSI reserve. In addition, maintenance works through sections of the SSSI have incorporated scrub clearance of invasive species, again with English Nature's advice, along sections of Main River.

- Wells Dunes: Following pedestrian erosion across Wells sand dunes, which destroys marram grass and leads to wind erosion of the vulnerable dune protection, timber board walks have been installed at the most damaged areas.
- Alternative and experimental methods of softer engineering: Research into softer and cheaper methods of protecting tidal river banks is being furthered by Catchment staff. Whilst some frontages still require the traditional protection offered by steel and timber revetment, appropriate frontages are being targeted with softer protection options. This approach is especially appropriate in Broadland and close liaison and cooperation continues with the Broads Authority on this issue. The use of geotextiles and recycled plastic piling continues, and the installation of locally grown reed bundles stacked into eroded river banks is being trialled.

At Hunstanton a section of damaged sand dunes has been protected by a length of dogtooth gabions, sand fencing and marram planting together with dune reinstatement.

The Catchment Engineer continues in his involvement with a National Research and Development Project into alternative methods of bank protection. The finished document is intended to provide an easy to use guide to soft engineering techniques.

- Water Level Management Structures: In general terms, the installation of landward guarding penstocks on tidal outfalls throughout Norfolk and Suffolk continues to be actively pursued as these structures are overhauled. In flood defence terms, they offer protection against saline intrusion and guard against a major flood risk caused by a possible failure of the tidal gates. Their installation also offers the opportunity to achieve positive management of upstream water levels under the Environment Agency's Water Level Management Plans.

Penstock installations on the River Hun outfall and River Burn outfall sluices have both enabled higher levels to be retained in these drought conditions.

- River Wensum: This river system with its SSSI designation, the first in the country, requires sensitive river management to sustain its ecological importance. As part of our routine maintenance works, flood defence operatives have been trained in tree coppicing techniques, to allow riverside trees to be managed.
- River Minster: Whilst carrying out machine desilting works on the river, the opportunity was taken to construct a new pond and clear the ditch system on the Darsham Nature Reserve managed by Suffolk Wildlife Trust.
- River Gipping - Baylham Mill: Machine works were necessary to restore the capacity of the two discharge channels from the mill, and as part of the revenue works shingle was imported to construct a low flow riffle at the confluence of the chamber to improve the fisheries habitat.

EXPERIMENTAL SOFT ENGINEERING

OLD HUNSTANTON



protection to sand dune defences



Experimental works showing hardwood faggotts, chestnut pale fencing and stone filled gabions, with accretion of sand

Water Level Management Plans

Water Level Management Plans (WLMPs) are a Ministry of Agriculture, Fisheries and Food (MAFF) initiative developed in 1994. The Plans provide a means whereby the water level requirements for a range of activities in a particular area, including agriculture, flood defence and conservation can be balanced and integrated. The *"Conservation Guidelines for Drainage Authorities"* (MAFF/DoE/Welsh Office, 1991) state that WLMPs should be prepared for areas where water levels are managed, the highest priority going to internationally important sites such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites.

Within the Norfolk and Suffolk Local Flood Defence District the Environment Agency is currently responsible for the preparation of 19 Water Level Management Plans. These include high profile sites such as Redgrave and Lopham Fens, Minsmere and the North Norfolk Coast. Because the Environment Agency controls the water levels at these sites, it is therefore responsible for preparing their WLMPs. These Plans have been endorsed by English Nature as written agreements. The Plans are treated as working documents and will be reviewed on a regular basis and updated or revised if the objectives are unable to be met or if circumstances change. They also seek to provide continuity and stability for these important sites and, by identifying opportunities, will allow the Flood Defence Committee, in undertaking its statutory duties, to further the conservation of wildlife and the enhancement of natural beauty.

LOCAL ENVIRONMENT AGENCY PLANS

Local Environment Agency Plans (LEAPs) are fully integrated plans covering all areas of interest to the Environment Agency. Within the Norfolk and Suffolk Local Flood Defence District there will be three such plans - North Norfolk, the Yare and East Suffolk. The Consultation Reports for all three must be published by December 1999. Catchment Management Plans were instigated by the former National Rivers Authority in 1990. Whilst Norfolk and Suffolk has full coverage of these, the plans are being progressively superseded by LEAPs which contain our additional responsibilities for waste regulation and integrated pollution control. The former Gipping/Stour Catchment Management Plan has been split, with the Gipping forming part of the East Suffolk Plan.

LEAPs provide a vision for each catchment, together with policies, objectives and actions to achieve overall improvements to the environment. Partnerships with other organisations are keenly sought. The Flood Defence function has an important role in these plans, alongside all the other functions within the remit of the Environment Agency.

HYDROLOGICAL REPORT

Rainfall

The monthly rainfall totals are shown in the following table.

Month	1961-90 Long Term Average (mm)	1996/97	
		Actual (mm)	% Average
April 1996	46	8	17%
May 1996	44	24	55%
June 1996	48	12	25%
July 1996	51	37	73%
August 1996	52	99	190%
September 1996	54	23	43%
October 1996	56	44	79%
November 1996	65	100	154%
December 1996	58	33	57%
January 1997	55	8	15%
February 1997	40	41	103%
March 1997	46	13	28%
Total for year	615	442	72%

April to July continued the trend of below average rainfall that has been evident since April 1995. August experienced a number of thunderstorms, which in some parts resulted in downpours in excess of 20mm. On 28 and 29 August a deep depression deposited between 35mm and 85mm. During September light rainfall was distributed evenly across the Catchment and evenly throughout the month, the total being well below the long term average. The October rainfall was sporadic, heavy events interspersing with long dry periods. In contrast, precipitation during November was well above average: heavy rainfall was experienced around the 19th and for the remainder of the month was distributed evenly across the catchment and evenly throughout the month. In December, January and March rainfall was again sporadic, light events interspersing long dry periods. Only three months of the year received rainfall in excess of the long term average, the last being February, with heavy rain being experienced around the 24th. During the remainder of February rain was distributed evenly across the catchment and evenly throughout the month.

Soil Moisture Deficit

The soil moisture deficit throughout the year has been above average. The SMD began to rise sharply from the beginning of April 1996 and peaked in July and August, dropping in early September to reflect the heavy downpours in late August. It then rose slightly through the remainder of September and stabilised during October before falling dramatically to 20mm through November, where it remained, dropping to 12.5mm during February, but rising to 25mm by the end of March 1997.

River Flows

April and May river levels were significantly below average. In early June the Bure, Yare, Waveney, Tas and Deben all breached the Amber Drought threshold, the flows in all rivers having seen a steady recession for three months and most flows being below the 95 percentile level. This trend continued into August, when the heavy downpour late in the month caused a short lived recovery in flow. The Waveney Augmentation Scheme was operated from mid June to late August. River flows remained low for the remainder of the period under review, showing no sign of winter recovery.

Groundwater

The year under review began with the levels in the deeper chalk aquifers all being below average and the shallower drift aquifers close to the long term minimum. All aquifer levels remained below average and continued to decline steadily throughout the remainder of the year, the Suffolk aquifers being particularly hard hit.

The winter recharge of groundwater that had been hoped for did not materialise, and a drought situation in summer 1997 now seems inevitable.

Storm Tide Warning Service

The Storm Tide Warning Service operated from 1-30 April 1996 and from 1 September 1996 to 31 March 1997. However, the Environment Agency was kept informed of particularly high astronomical tides occurring during the summer months.

The new flood warning procedures were operated for the first time between 29 and 30 August 1996 when high astronomical levels combined with strong north westerly winds to force sea levels above the Yellow flood threshold on three successive surge tides. North Norfolk was worst affected: during the daytime tide on 29 August, the Amber level was reached at Wells with a surge of 0.75m.

A series of high tides ran over the period 29 to 30 October 1996, the most serious being the daytime tide on the 29th. One Red warning and five Amber warnings were issued. Between December 1996 and March 1997 one Yellow warning was issued.

FINANCIAL REPORT

The following notes apply to the accompanying statement:-

FINAL ACCOUNTS 1996/97 - VARIANCE ANALYSIS

Line Nos.

8. Operating and management expenditure at £4140k was £8k or 0.19% more than the revised budget. The additional £16k maintenance works were the result of emergency works in Broadland and reprofiling the shingle bank sea defences at Salthouse during February and March 1997. Savings of £8k were made on administration and general charges.
16. The additional £16k income was the result of additional asset sales and general drainage charges.
21. Total capital expenditure was £33k less than the revised budget of £18486k a variance of 0.18% and the maximum MAFF Grant Income was achieved.
27. A negative balance of £1451k was carried forward to 1997/98 and is due to capital expenditure of £10100k being brought forward from 1997/98 to 1996/97. Additional MAFF grant of £8085k was also received. The deficit will be funded as originally intended in the 1997/98 budget.

FINAL ACCOUNTS 1996/97

NORFOLK AND SUFFOLK LFDC

(£000's)

LINE NO		OUTTURN 1995/96	REVISED BUDGET 1996/97	OUTTURN 1996/97	VARIANCE
	A. OPERATING AND MANAGEMENT EXPENDITURE				
	Maintenance Works				
1	Main River	851	772	762	(10)
2	Sea Defences	1240	1498	1525	27
3	Flood Warning	30	30	30	
4	Other	114	161	160	(1)
5	Land and Properties	—	—	—	
6	Contributions to IDBs	258	176	176	
7	Administration and General Charges	1445	1495	1487	(8)
8	TOTAL OPERATING AND MANAGEMENT EXPENDITURE	3938	4132	4140	8
9	Revenue Contribution to Capital Outlay	3411	5746	5706	(40)
10	Working Capital	((50))	(20)	(20)	
11	TOTAL EXPENDITURE	7299	9858	9826	(32)
	LESS INCOME				
12	Precepts	6240	6902	6902	
13	General Drainage Charges	637	691	693	(2)
14	Interest Received	230	209	209	
15	Miscellaneous (Including Land Sales)	104	91	105	(14)
16	TOTAL INCOME	7211	7893	7909	(16)
17	NET SURPLUS/(DEFICIT) TRANSFERRED TO RESERVE	(88)	(1965)	(1917)	(48)
	B. CAPITAL EXPENDITURE				
18	Grant Aided Works	6848	17000	17019	19
19	Non Grant Aided Works	501	196	202	6
20	Capital Salaries/Consultants Fees	1004	1290	1232	(58)
21	TOTAL CAPITAL EXPENDITURE	8353	18486	18453	(33)
	LESS				
22	MAFF Grant	4875	12740	12747	(7)
23	Capital Contributions	67	—	—	
24	Revenue Contributions to Capital Outlay (in Section A above)	3411	5746	5706	(40)
	C. RESERVE				
25	i) Balance Brought Forward at 1.4.96	554	466	466	(48)
26	ii) Transfer of Operating Surplus/(Deficit)	(88)	(1965)	(1917)	48
27	iii) Balance Carried Forward to 1.4.97	466	(1499)	(1451)	
28	Grant Earning Ceiling	6500	17000	17000	
29	Section 47 Balances % of Gross Expenditure	2.15	(6.63)	(6.43)	

IC/COMS/June 9, 1997/9

SECTION 57(1) LAND DRAINAGE ACT 1991

CONTRIBUTIONS TO INTERNAL DRAINAGE BOARDS

Contributions are paid to Internal Drainage Boards for the cost of dealing with upland water flowing into their districts. This method of calculation is regionally standard, having been agreed by all the Local Flood Defence Committees. Contributions for the year ending 31 March 1997 are shown below:-

REF NO	INTERNAL DRAINAGE BOARD	TOTAL (£)
NS/1	North Norfolk	224
NS/6	River Wensum	16243
NS/7	Upper Bure	7729
NS/8	Middle Bure	3720
NS/9	Lower Bure	11580
NS/10	Smallburgh	6893
NS/11	Happisburgh to Winterton	8894
NS/12	Repps Martham and Thurne	4994
NS/13	Muckfleet and South Flegg	9838
NS/14	Upper Yare and Tas	6476
NS/15	Lower Yare First	2494
NS/16	Lower Yare Second	6997
NS/17	Lower Yare Third	7207
NS/18	Lower Yare Fourth	1742
NS/19	Limpenhoe and Reedham	1151
NS/20	Langley Chedgrave and Toft Mon	—
NS/21	Burgh Castle	1612
NS/22	Waveney Valley	9057
NS/23	Lower Waveney	12970
NS/24	Lower Waveney Second	7434
NS/25	Lower Waveney Third	16270
NS/26	Blundeston Flixton and Oulton	1708
NS/27	Oulton Carlton Colville and Barnby	1886
NS/28	Lothingland	—
NS/29	River Blyth	8694
NS/30	Minsmere	535
NS/31	Upper Alde	668
NS/32	Fromus Alde and Thorpness	1203
NS/33	Middle Alde	3602
NS/34	River Deben (Upper)	319
NS/35	Lower Alde	2115
NS/36	Alderton Hollesley and Bawdsey	—
NS/37	River Deben (Lower)	5204
NS/38	River Gipping	<u>6593</u>
	TOTAL	176052
	1996/97 REVISED BUDGET	<u>176052</u>
	VARIANCE	<u>NIL</u>

FLOOD DEFENCE SCHEMES

SCHEME NUMBER	SCHEME DESCRIPTION	EXPENDITURE '000
A. GRANT ELIGIBLE EXPENDITURE		
MTA40351	BENACRE PUMPING STATION	2
MTA49011	ARTS PH 1	1
MTA49012	ARTS PHASE 2	1
MTA49023	ARTS PHASE PHASE 3 BATCH B	6
MTA49034	ARTS PHASE 4 BATCH C	1
MTA49044	ARTS PHASE 4 BATCH D	2
MTA41995	REGIONAL FLOOD WARNING	48
MTB40248	R.DEBEN WOODBRIDGE PHASE 5	38
MTB40375	SOUTH OULTON BROAD	8
MTB40402	BROADLAND COMP 11 HALVGTE PH 2 & PH 6	161
MTB40407	BROADLAND COMP 11 HALVGTE PH 7	83
MTB40408	BROADLAND COMP 11 HALVGTE PH 8 : R.YARE	75
MTB40409	BROADLAND COMP 11 HALVGTE PH 9	6
MTB40506	BROADLAND:REEDHAM/HADDISCOE CUT	246
MTB40601	BROADLAND COMP 36 STH BREYDON	23
MTB41410	GREAT YARMOUTH ABC WHARF	150
MTB41520	IPSWICH FLOOD DEFENCES	6
MTB42126	BLYTH - SUFFOLK ESTUARY STRATEGY	61
MTB42127	DEBEN - SUFFOLK ESTUARY STRATEGY	61
MTB40254	GREAT YARMOUTH F D COMP F	5
MTB40259	ALDEBURGH S D BEACH MONITORING	11
MTB40273	STOWMARKET / NEEDHAM	-18
MTB40274	R.GIPPING STOWMARKET FLOOD PROTN	26
MTB40323	BAWDSEY SEA DEFENCES	477
MTB40370	FELIXSTOWE FERRY MONITORING	7
MTB40376	HOLME DUNES	4
MTB41302	HAPPISBURGH / WINTERTON PHASE 1	-71
MTB41308	HAPPISBURGH / WINTERTON PHASE 2	14573
MTB41313	HAPPISBURGH / WINTERTON - WAXHAM	2
MTB41314	HAPPISBURGH / WINTERTON - STRATEGIC MONT	88
MTB41315	SEA PALLING / WAXHAM PHASE 2	-24
MTB41317	EMER BEACH RECHARGE SEA PALLING	818
MTB41502	CLEY SEA DEFENCES PHASE 2	82
MTB48893	SHORELINE MONITORING	60

17019

FLOOD DEFENCE SCHEMES

SCHEME NUMBER	SCHEME DESCRIPTION	EXPENDITURE '000
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B. NON GRANT ELIGIBLE EXPENDITURE

MTA49044	ARTS PHASE 4 BATCH D	1
MUC41022	R.BURN OUTFALL SLUICE	43
MUC41026	SHARMFORD LOCK RIVER GIPPING	1
MUC41036	BELTON P.S. - IDB CONTRIBUTION	42
MUC41041	MENDHAM MILL FLOODGATE REPLMNT	12
MUC41046	GRESSENHALL MILL	1
MUC41048	R.MUN OUTFALL SLUICE	15
MUC41054	R.DEBEN BAWDSEY P.S.	10
MUC41055	FALKENHAM IDB CONTRIBUTION	7
MUC41053	ALDEBURGH TOWN MARSH PENSTOCKS	7
MUD41052	TRIMLEY & SHOTLEY FLOOD DEFENCES	17
MTB40323	BAWDSEY SEA DEFENCES	1
MTB40372	BURNHAM OVERY / WELLS WEST BANK	8
MTB40376	HOLME DUNES	17
MTB41308	HAPPISBURGH/WINTERTON PHASE 2	8
MTB48893	SHORELINE MONITORING	10
MTB42006	BROADLAND - STATUTORY LIASON	1
MTB43220	BROADLAND - COMP 22 STRATEGY	1

202

C.	SALARIES	387
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D.	CONSULTANTS	845
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1232

TOTAL CAPITAL EXPENDITURE

18453

STAFF STRUCTURE AS AT 31st MARCH 1997

