

**POLICY :
SAND RIVER CATCHMENT
MANAGEMENT PLAN**

[Approved by Council : C 16/08/03]

Executive Summary of the Sand River Catchment Management Plan

This Catchment Management Plan has identified management interventions required in the Sand River Catchment. The management of this urban drainage system will be facilitated and enhanced by the adoption of the recommended strategies and projects which together are aimed at reducing flood risk, improving water quality and improving amenity value of the river corridors, vleis and the Zandvlei estuary.

Currently significant flooding risks are present which could affect major roads, industrial and residential properties. Unnecessary erosion and siltation due to poor land management practices are causing high maintenance costs. Water quality and biodiversity are both compromised and as a consequence the amenity value of the river corridors and vleis is not being realized. This plan goes a long way towards improving all these elements.

This Catchment Management Plan has evolved over the last three years under the guidance of the Sand River Catchment Forum. The process has been phased and included a situational analysis, a review of all literature and previous studies, the initiation of new studies, public participation and finally the development of this plan. The Catchment Management Plan identifies all significant management issues and sets out goals and strategies to address the issues.

To implement the strategies a set of projects and further investigations have been identified. As such, the CMP represents a complete suite of management tools for decision-makers and managers alike enabling the holistic evaluation of management requirements within the catchment.

By providing the necessary comprehensive overview of all issues each of which has been given a priority rating, the responsible selection of projects according to available budget is facilitated. Furthermore this plan has involved the input of many stakeholders and thus should be readily acceptable by the public at large. The plan also paves the way for partnerships and shared responsibilities in implementing management strategies where appropriate.

The list of management issues contained within this Catchment Management Plan is detailed and the strategies designed to address these issues are specific. Some strategies and projects are immediately implementable as part of the routine business of the Catchment, Stormwater and River Management Branch and its partners, others require capital investment or further work before implementation will be possible such as 'Design and Construct Projects' or 'Research Projects'.

A summary of the more significant projects are listed here:-

To reduce flood risk:-

1. Construct formal detention facility upstream of the M3.
2. Construct formal detention facility on the farm Dreyersdal.

3. Widen Diep River between Burnham Road and the Main Road (M4)
4. Widen Keyzers River between the Main Road (M4) and Military Road.
5. Calibrate Flow monitoring devices and verify data.
6. Install additional monitoring stations within the catchment

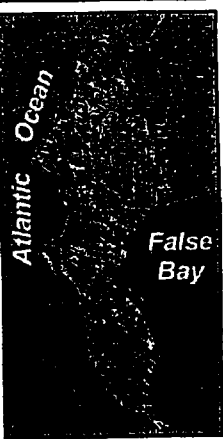
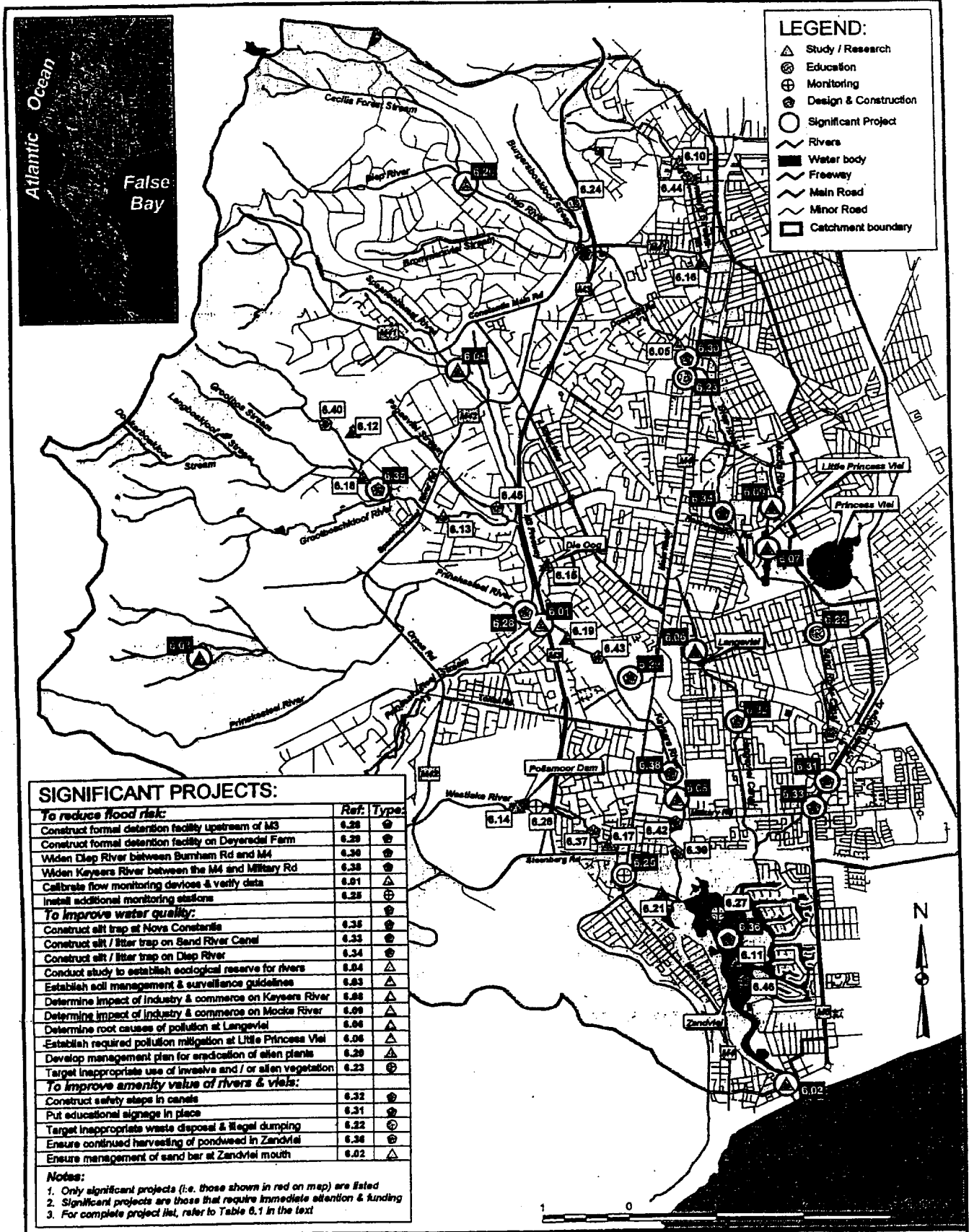
To improve water quality:

7. Construct silt trap at Nova Constantia
8. Construct Silt/litter trap on the Sand River canal
9. Construct Silt/Litter trap on the Diep River
10. Conduct study to establish the ecological reserve for rivers
11. Establish soil management and surveillance guidelines
12. Determine the impact of industry and commerce on the Keyzers River
13. Determine the impact of industry and commerce on the Mocke River
14. Determine the root cause of pollution at Langevlei
15. Establish the required pollution mitigation measures at Little Princess Vlei
16. Develop a management plan for the replacement of alien vegetation with indigenous plants
17. Introduce a programme targeting the inappropriate use of alien and invasive vegetation

To improve the amenity value of the rivers and vleis:

18. Construct safety steps in the canals
19. Put educational signage in place
20. Introduce a programme targeting the inappropriate waste disposal and illegal dumping
21. Ensure continued harvesting of pondweed at Zandvlei
22. Ensure continued management of sand bar at Zandvlei mouth

This Catchment Management Plan provides for the management of the Sand River catchment for the next five years following which a review and update of the plan is recommended. It is supported by a carefully considered and comprehensive set of prioritised action plans enabling decision makers and managers alike to make balanced and informed decisions regarding which projects are deserving of funding.



LEGEND:

- △ Study / Research
- ⊕ Education
- ⊕ Monitoring
- ⊕ Design & Construction
- Significant Project
- ~ Rivers
- ▭ Water body
- ▭ Freeway
- ▭ Main Road
- ▭ Minor Road
- ▭ Catchment boundary

SIGNIFICANT PROJECTS:

	Ref:	Type:
To reduce flood risk:		
Construct formal detention facility upstream of M3	6.26	⊕
Construct formal detention facility on Deyersdal Farm	6.28	⊕
Widen Diep River between Burnham Rd and M4	6.30	⊕
Widen Keyers River between the M4 and Military Rd	6.38	⊕
Calibrate flow monitoring devices & verify data	6.01	△
Install additional monitoring stations	6.25	⊕
To improve water quality:		
Construct silt trap at Nova Constantia	6.35	⊕
Construct silt / litter trap on Sand River Canal	6.35	⊕
Construct silt / litter trap on Diep River	6.34	⊕
Conduct study to establish ecological reserve for rivers	6.04	△
Establish soil management & surveillance guidelines	6.03	△
Determine impact of industry & commerce on Keyers River	6.08	△
Determine impact of industry & commerce on Mocke River	6.09	△
Determine root causes of pollution at Langevlei	6.06	△
Establish required pollution mitigation at Little Princesses Vlei	6.06	△
Develop management plan for eradication of alien plants	6.29	△
Target inappropriate use of invasive and / or alien vegetation	6.23	⊕
To improve amenity value of rivers & vleis:		
Construct safety steps in canals	6.32	⊕
Put educational signage in place	6.31	⊕
Target inappropriate waste disposal & illegal dumping	6.22	⊕
Ensure continued harvesting of pondweed in Zandvlei	6.34	⊕
Ensure management of sand bar at Zandvlei mouth	6.02	△

Notes:

- Only significant projects (i.e. those shown in red on map) are listed
- Significant projects are those that require immediate attention & funding
- For complete project list, refer to Table 6.1 in the text

SAND RIVER CATCHMENT MANAGEMENT PLAN

TABLE 6.1 Projects

NO.	PROJECT DESCRIPTION	ISSUE REF	GEO. REF. UNIT(S)	PRIORITY	RESPONSIBILITY	COST EST. (R MILLION)	BY WHEN (START DATE)
1. STUDIES / RESEARCH							
6.01	Conduct studies to: <ul style="list-style-type: none"> Establish integrity of recorded data from existing monitoring devices Calibrate existing monitoring devices Convert recorded data to flow data & correlate with rainfall data Calibrate existing hydrological models 	Qn.4 C Ql.2 A	Dreyersdal Wynberg Zandvlei	1	TR&S	0.1 - 1.0	2003
6.02	Conduct study to: <ul style="list-style-type: none"> Review river maintenance policy Formulate flood early warning monitoring strategy for management of estuary mouth 	Qn.1 E Qn.1 F Qn.2 A Ql.1 H Ql.1 I Ql.7 A So.4 C So.6 A	Zandvlei Dreyersdal	1	TR&S	0.1 - 1.0	2003
6.03	Conduct studies to: <ul style="list-style-type: none"> Establish soil management guidelines for catchment Establish soil management surveillance policy Quantify silt removal requirements within the catchment Identify and evaluate locations for silt traps 	Qn.2 C Qn.3 C Ql.2 D Ql.7 D So.3 A	Alphen Constantia Tokai Dreyerdal Zandvlei	1	TR&S	0.1 - 1.0	2003
6.04	Conduct study to: <ul style="list-style-type: none"> Establish ecological reserve requirements Formulate action plans 	Ql.11.A	ALL	1	DWAF TR&S	0.1 - 1.0	2003
6.05	Conduct study to: <ul style="list-style-type: none"> Establish remedial action required between Burnham Rd and the M4 Main Rd (in progress) 	Qn.1 G	Plumstead	1	TR&S	0.1 - 1.0	2002

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TABLE 6.1 Projects

NO.	PROJECT DESCRIPTION	ISSUE REF	GEO. REF. UNIT(S)	PRIORITY	RESPONSIBILITY	COST EST. (R MILLION)	BY WHEN (START DATE)
6.06	<p>Conduct study to:</p> <ul style="list-style-type: none"> Determine root cause of contamination at Langevlei inlet Establish appropriate mitigation & rehabilitation measures Compile pollution abatement plans 	Q1.1 E Q1.1 F	Plumstead	1	TR&S WS	< 0.1	2003
6.07	<p>Conduct study to:</p> <ul style="list-style-type: none"> Establish appropriate mitigation measures for contamination at Little Princess Vlei inlet Compile pollution abatement plans. 	Q1.1 G	Plumstead	1	TR&S WS	< 0.1	2004
6.08	<p>Audit and measure:</p> <ul style="list-style-type: none"> Impact of industrial and commercial practices on the lower Keyzers River in Retreat Establish appropriate mitigation measures 	Q1.8 A	Retreat	1	DWAF TR&S SWM WS	0.1 - 1.0	2003
6.09	<p>Audit and measure:</p> <ul style="list-style-type: none"> Impact of industrial and commercial practices on the Mocke River upstream of Little Princess Vlei Establish appropriate mitigation measures 	Q1.8 A	Plumstead	1	DWAF TR&S SWM WS	0.1 - 1.0	2004
6.10	<p>Conduct study to:</p> <ul style="list-style-type: none"> Quantify detention storage requirements in catchment Evaluate locations for stormwater attenuation facilities 	Qn.1 A Qn.1 H	Dreyersdal Kirstenhof Wynberg	1	TR&S	0.1 - 1.0	2004
6.11	<p>Conduct study to:</p> <ul style="list-style-type: none"> Quantify dredging volumes for Zandvlei recreational sailing 	Qn.1 E Qn.3 E	ALL	2	TR&S OS&NC	0.1 - 1.0	2004

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NO.	PROJECT DESCRIPTION	ISSUE REF	GEO. REF. UNIT(S)	PRIORITY	RESPONSIBILITY	COST EST. (R MILLION)	BY WHEN (START DATE)
6.12	Conduct study to: <ul style="list-style-type: none"> Determine sources of pollution in catchment Assist in implementation of measures to mitigate pollution in upper catchment. Establish pollution surveillance & auditing policy. 	QI.1 A QI.1 D	Constantia Westlake Tokai	1	DWAF SWM WS	0.1 - 1.0	2003
6.13	Conduct studies to : <ul style="list-style-type: none"> Review sewer & stormwater infrastructure maintenance policy Locate problem areas where sewer to stormwater overflows occur. Establish domestic waste disposal practices in the catchment Quantify requirements for awareness programme on impact of inappropriate waste disposal Establish pollution incident / dumping reporting system is implemented and effective. 	QI.1 B QI.1 D QI.4 A QI.4 B QI.4 F So.1 B So.4 A	Constantia Westlake Zandvlei Alphen Dreyersdal	1	DWAF TR&S SWM	0.1 - 1.0	2003
6.14	Conduct study to: <ul style="list-style-type: none"> Determine root cause of pollution of Pollsmoor dam Establish appropriate mitigation measures 	QI.4 H	Kirstenhof	1	PWD DWAF WS	< 0.1	2
6.15	Conduct study to: <ul style="list-style-type: none"> Establish measures to eliminate or control blue green algal growth at 'Die Oog' (In progress) 	QI.7 C	Dreyersdal	1	OS&NC WS TR&S	< 0.1	2003
6.16	Conduct study to: <ul style="list-style-type: none"> Establish & quantify the contribution of the Wynberg Stream to flooding in the Dlep River system 	Qn.1 K	Wynberg	2	TR&S	0.1 - 1.0	2004
6.17	Conduct study to: <ul style="list-style-type: none"> Establish remedial action required to river channel upstream of M42 in Kirstenhof 	Qn.1 H Qn.1 I	Kirstenhof	2	PWD TR&S	< 0.1	2004

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6.18	Conduct study to: <ul style="list-style-type: none"> Establish remedial action required upstream of Nova Constantia Rd 	Qn.1 J Qn.2 B	Constantia	2	TR&S	< 0.1	2005
6.19	Conduct study to: <ul style="list-style-type: none"> Establish remedial action required between M3 freeway and M4 Main Rd 	Qn.2 A	Dreyersdal	3	TR&S	< 0.1	2005
6.20	Conduct study to: <ul style="list-style-type: none"> Develop a management plan for replacement of alien vegetation (including aquatic and kikuyu) with indigenous plants 	So.4.C So.4.D So.6.B	ALL	1	TR&S OS&NC	< 0.1	2005
6.21	Conduct study to: <ul style="list-style-type: none"> Develop a management plan to improve the habitat diversity and integrity in the catchment (Refer to recommendations of Afridev report on lower Keyzers Rehabilitation) 	QI.1 QI.2	ALL	3	OS&NC WS TR&S DWAF	< 0.1	2005
2. EDUCATION / AWARENESS PROGRAMMES							
6.22	Introduce educational / awareness programmes targeting: <ul style="list-style-type: none"> Inappropriate disposal of waste / garden refuse in upper catchment Littering / dumping in Sand River canal 	QI.1 A QI.1 B QI.1 D QI.6 A So.1 B So.1 C So.1 D So.4 A	Constantia Westlake Plumstead Zandvlei Dreyersdal	1	SWM OS&NC TR&S	0.1 – 1.0	2003
6.23	Introduce educational / awareness programmes targeting: <ul style="list-style-type: none"> Inappropriate sale and use of invasive / alien species & control of noxious weeds 	So.3 B So.4 B	ALL	1	OS&NC TR&S	< 0.1	2003



TABLE 6.1 Projects

NO.	PROJECT DESCRIPTION	ISSUE REF	GEO. REF. UNIT(S)	PRIORITY	RESPONSIBILITY	COST EST. (R MILLION)	BY WHEN (START DATE)
6.24	Introduce educational / awareness programmes targeting: <ul style="list-style-type: none"> Security issues, squatters 	So.6 A	ALL	2	OS&NC	<0.1	2004
3. MONITORING							
6.25	Install monitoring devices: <ul style="list-style-type: none"> Rain gauges at Groot Constantia and Zandvlei Flow monitoring at M42 culvert on Westlake river 	Qn.4 A Qn.4 B	Constantia Zandvlei Kirstenhof	1	TR&S	<0.1	2003
6.26	Introduce additional biological monitoring: <ul style="list-style-type: none"> At stormwater outlet near Royal Road At Pollsmoor Prison 	Ql.3 A Ql.4 H	Zandvlei Kirstenhof	2	WS TR&S	0.1 - 1.0	2004
6.27	Conduct study to <ul style="list-style-type: none"> Review current monitoring points and parameters for the catchment Introduce additional monitoring as indicated by the studies conducted to determine root causes of pollution at various locations. Implement bioassessments and ecosystem health monitoring in Zandvlei and rivers as indicated in Ql.10. Assess Ghost frog population / habitat. 	Ql.10A	ALL	3	WS TR&S	0.1 - 1.0	2005
4. DESIGN, CONSTRUCTION & MAINTENANCE							
6.28	Design & construct: <ul style="list-style-type: none"> Formal detention facility upstream of M3 on Keyzers River 	Qn.1 A	Dreyersdal	1	TR&S	1.0 +	2003
6.29	Design & construct: <ul style="list-style-type: none"> Detention facility on Dreyersdal Farm 	Qn.1 B	Dreyersdal	1	TR&S	1.0 +	2003

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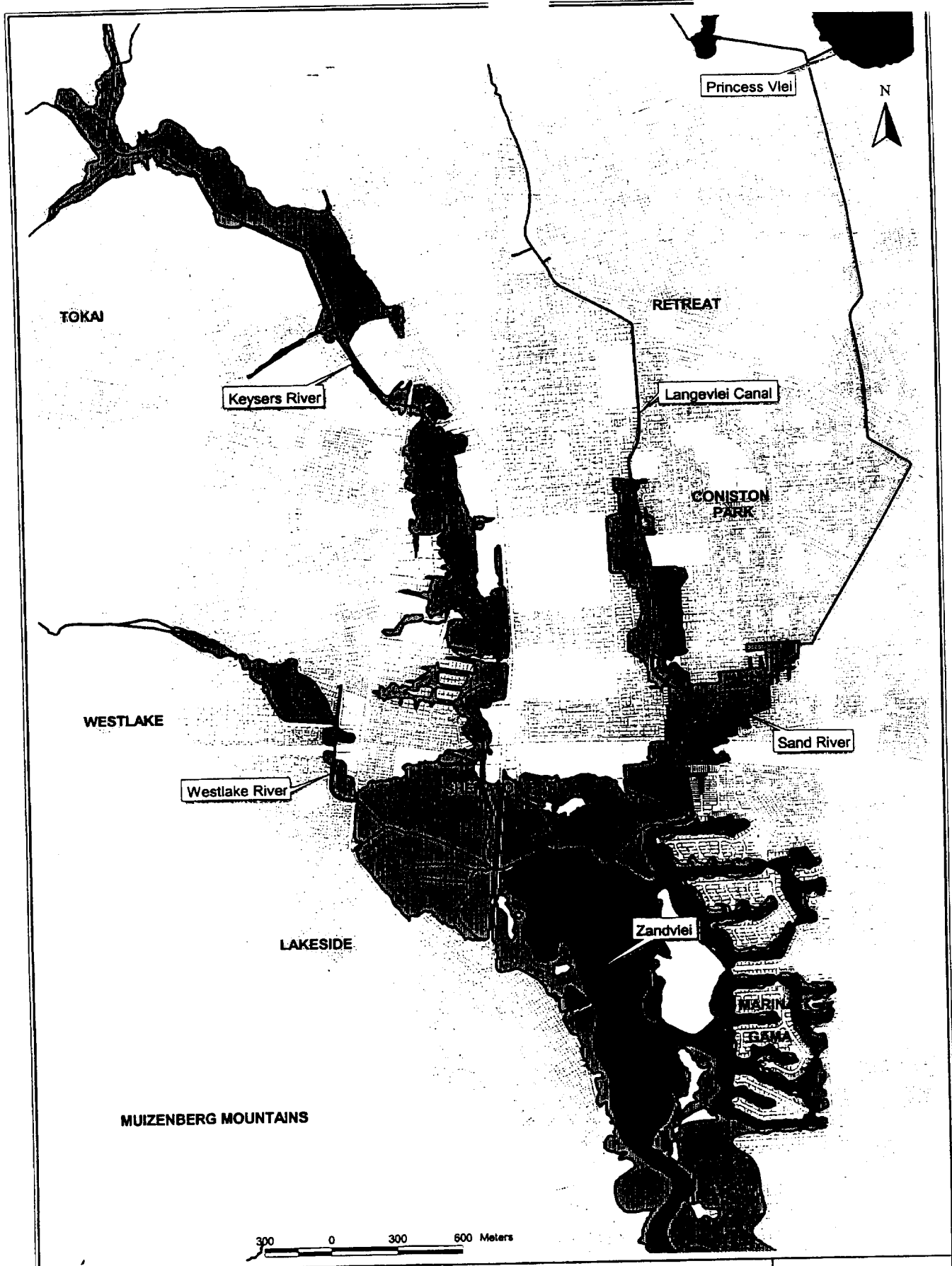
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6.30	Design & construct: • Widened channel between Burnham Rd and the M4 Main Rd on the Diep River	Qn.1 G	Plumstead	1	TR&S	1.0 +	2003
6.31	Design & construct: • Educational signage at estuary mouth • Educational signage on Constantia Main Road • Educational signage on Spaanschemat River Road • Ablution signage at Zandvlei estuary mouth • Educational signage on Sand River canal	Ql.4 A Ql.4 G So.1 A So.1 D So.4 A	Zandvlei Plumstead Constantia Dreyersdal	1	TR&S OS&NC	0.1 - 1.0	2003
6.32	Design & construct: • Steps in concrete canals	So.2 A	Plumstead	1	TR&S	0.1 - 1.0	2003
6.33	Design & construct: • Silt and litter traps on Sand River canal upstream of Military Road	Qn.3 D Ql.6 A So.1 C	Plumstead	1	TR&S SWM	1.0 +	2004
6.34	Design & construct: • Silt and litter traps on Diep River upstream of Roscommon Road	Qn.3 D Ql.6 A So.1 C	Plumstead	1	TR&S	1.0 +	2004
6.35	Design & construct: • Silt trap at Nova Constantia (design complete)	Qn.3 A Qn.3 B	Constantia	1	TR&S	1.0 +	2004
6.36	Maintenance: • Purchase new weed harvester	Ql.5 B	Zandvlei	1	TR&S	1.0 +	2004
6.37	Design & construct: • Widened channel upstream of M42 in Kirstenhof on the Westlake River	Qn.1 H	Kirstenhof	2	TR&S PWD	1.0 +	2004

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6.38	Design & construct: <ul style="list-style-type: none"> Widened river channel between the M4 Main Rd and Military Rd on the Keyzers River 	Qn.1 C	Retreat	1	TR&S	1.0 +	2004
6.39	Design & construct: <ul style="list-style-type: none"> Rehabilitation of river corridor between Military Rd and Zandvlei 	So.5 F So.5 G	Retreat	2	OS&NC	1.0 +	2004
6.40	Design & construct: <ul style="list-style-type: none"> Silt trap at Groot Constantia 	Qn.3 A Qn.3 B	Constantia	2	TR&S	1.0 +	2005
6.41	Design & construct: <ul style="list-style-type: none"> Remedial & rehabilitation measures to Sand River and Langevlei concrete canals 	So.2 A	Plumstead	2	TR&S OS&NC	1.0 +	2005
6.42	Design & construct: <ul style="list-style-type: none"> Fencing along Military Road adjacent to POS 	So.2 B	Retreat	2	OS&NC	0.1 - 1.0	2004
6.43	Design & construct: <ul style="list-style-type: none"> Rehabilitated channel between M3 freeway and M4 Main Rd on the Keyzers River 	Qn.2 A	Dreyersdal	3	TR&S	1.0 +	2006
6.44	Design & construct: <ul style="list-style-type: none"> Remedial measures and detention pond at Maynardville 	Qn.1 K	Wynberg	3	TR&S OS&NC	1.0 +	2005
6.45	Design & construct: <ul style="list-style-type: none"> Amenity / recreational facilities at Willow Dam 	So.5 K	Constantia	3	SPA: Engineering, Residents, Parks & Recreation	0.1 - 1.0	2004
6.46	Design & construct: <ul style="list-style-type: none"> Dredging of Zandvlei 	Qn.1 E Qn.3 E	Zandvlei	2	TR&S OS&NC	0.1 - 1.0	2004



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1 : 100 YEAR FLOODLINES