

(f) Pilot Project Workshop

At this workshop, progress with pilot project set-up will be discussed and lessons shared.

(2) Planning (Kameelboom and Sehoko)

The foregoing institutional preparations should provide a firm foundation for project planning. Such planning should allow for as much participation as possible in the time available. Some of the early planning tasks (eg surveying and mapping) might proceed concurrently with the set-up process. The scope of work that follows applies specifically to Kameelboom and Sehoko, where significant infrastructural work is envisaged.

(a) Surveying and Mapping

- 1) Define pilot project area.
- 2) Obtain relevant maps and aerial photographs and commission further photography if necessary.

(b) Preliminary Design

The preliminary design task will produce a series of options that can be presented to the Local PSC for discussion and prioritisation. The Local PSC should also find counterparts to work with the design team, possibly members of the LWC.

- 1) Agree design parameters with Local PSC. These include priorities, needs, budget.
- 2) Evaluation of sources and yields.
- 3) Survey pipeline routes and positioning of infrastructure.
- 4) Design reticulation and facilities, with options.
- 5) Discuss options with Local PSC.
- 6) Discuss options with the Project Execution Group.
- 7) Agree project parameters with Local PSC. These include priorities, needs, budget.
- 8) Survey pipeline routes and positioning of infrastructure.
- 9) Confirm ownership and availability of servitudes for proposed routes.
- 10) Design reticulation and facilities, with options.
- 11) Discuss options with Local PSC.
- 12) Discuss options with the Project Execution Group.

(c) Present Options to the Community.

The design options should be presented to the community. In this way the beneficiaries are empowered to make planning decisions, and also to take ownership of the development.

- 1) Workshop options with community, and determine way forward.
- 2) Discuss implications of project implementation, including management,

operations and maintenance and cost recovery.

- 3) Obtain an unambiguous mandate to proceed, and a commitment to support the project in terms of management resources and payment for services.

(d) Plan Water Supply Management System and Process

This task is to assist the community to plan for the management of the water supply system, including recovery of costs. If a viable procedure is already in place, this will not be disturbed. Existing structures will form the core of the system.

- 1) Assess needs and technical requirements.
- 2) Assist existing skills and organisational resources.
- 3) Assess training needs and identify training providers.
- 4) Design training programme.
- 5) Identify, form, and mandate a task group to take the management system planning process further. This task group must work very closely with local government and other key interests.

(e) Plan Operations and Maintenance System and Process

This task is to assist the community to plan for the operation and maintenance of the water supply system. If a viable procedure is already in place, this will not be disturbed. Existing structures will form the core of the system.

- 1) Assess needs and technical requirements.
- 2) Assist existing skills and organisational resources.
- 3) Assess training needs and identify training providers.
- 4) Design training programme.
- 5) Identify, form, and mandate a task group to take the management system planning process further. This task group must work very closely with local government and other key interests.

(3) Implementation (Kameelboom and Sehoko)

In this stage, implementation of the infrastructural development takes place. This must be accompanied by the continuation of the capacity building and communication programmes, and the continued development of structures and systems for water management (and cost recovery), and operations and maintenance.

(a) Detailed Design and Preparation of Tender Documentation.

- 1) Revision and refinement of preliminary designs.
- 2) Obtain servitude for pipelines, reservoirs and pumping stations (including temporary easements for construction.
- 3) Further technical work, if required.
- 4) Prepare tender documentation. In discussion with the Local PSC, this should provide opportunities for local contractors and sub-contractors. The tender

documentation must follow DWAF and RDP guidelines regarding affirmative action and labour-based construction.

- 5) Discuss tender documentation with Local PSC and Project Execution Group, and obtain a mandate to proceed.

(b) Appoint Contractors

- 1) Advertise according to DWAF/RDP guidelines.
- 2) Develop adjudication criteria and process in consultation with Local PSC (according to DWAF/RDP guidelines).
- 3) Adjudicate submissions and appoint contractors. The Local PSC must be consulted on the selection, and must support the final decision.
- 4) Brief contractors (Local PSC and JICA project team).
- 5) Agree project management roles and responsibilities with the Local PSC.

(c) Project Management of Contracts

- 1) Implement agreed project management process.
- 2) Ensure compliance with conditions regarding local involvement.
- 3) Certify payment of contractors.

(d) Monitor and Evaluate Training Associated with Contract Execution.

The execution of the contract provides opportunities for local people to obtain skills. Such training will be a requirement of the contract, but must be monitored and evaluated.

- 1) Responsible Local PSC member to set up a monitoring schedule and criteria.
- 2) Monitor trainees, and identify support where needed.
- 3) Arrange post-training vocational counselling.
- 4) Prepare training evaluation report.

(e) Best Practice and Systems Workshop

In order to share pilot project experiences, and to evaluate best practice before the implementation of water supply management and operations and maintenance systems, a workshop under the auspices of the Project Implementation Forum should be held. The workshop will be part of the capacity building mandate of the Project Execution Group, and will explore ongoing supportive relationships between the pilot communities and bodies such as MW and the District Councils.

- 1) Identify and invite interested parties.
- 2) Brief Local PSCs on presentations.
- 3) Prepare presentations.
- 4) Hold workshop.
- 5) Prepare a report (manual) for wider circulation.
- 6) Incorporate relevant findings

(f) Install Water Supply Management System and Process

The task team established to plan this process should now activate the plan. The task team will have worked closely with local government and other key interests, and should have been mandated by these actors to proceed. Local government should, in most cases, take responsibility for implementing the plan.

- 1) Finalise arrangements with local government.
- 2) Install organisational system, procedures, technical resources and financial arrangements.
- 3) Agree and install reporting and monitoring structures, and an agreed code of community accountability.

(g) Install Water Supply Operations and Maintenance System and Process

The task team established to plan this process should now activate the plan. The task team will have worked closely with local government and other key interests, and should have been mandated by these actors to proceed. Local government should, in most cases, take responsibility for implementing the plan.

- 1) Finalise arrangements with local government.
- 2) Install organisational system, procedures, technical resources and financial arrangements.
- 3) Agree and install reporting and monitoring structures, and an agreed code of community accountability.

(h) Project Commissioning and Handover

- 1) Commissioning ceremony.
- 2) Preparation and handover of commissioning manuals/documentation.
- 3) Detailed briefing of post-commissioning managers.

(i) Evaluation and Completion Report

- 1) Formulate structure.
- 2) Prepare draft report.
- 3) Present report.
- 4) Finalise.

(4) Planning (Ga-Rasai and Bapong)

The scope of work that follows applies to Ga-Rasai and Bapong, where the pilot project work will be predominantly institutional in nature.

(a) Surveying and Mapping

- 1) Define pilot project area.

- 2) Obtain relevant maps and aerial photographs and commission further photography if necessary.
- 3) Commission survey work (if needed).
- 4) Prepare detailed site maps (if needed).

(b) Technical Priorities and Options

This task will review existing infrastructure and will formulate options to deal with shortcomings. These options can be presented to the Local PSC for discussion and prioritisation. The Local PSC should also find counterparts to work with the technical team, possibly members of the LWC.

- 1) Confirm population, level of service and water demand figures assumed for Phase 1.
- 2) Carry out water sampling and analysis to verify quality.
- 3) Conduct a condition survey to determine capacity and yield of existing facilities and determine the extent of any remedial work necessary.
- 4) Agree project parameters with the Local PSC. These include priorities, needs, budget.
- 5) Prepare technical options within these parameters. Possible works may include the repair and upgrading of certain infrastructure, the installation and pilot testing of metering systems (including prepaid metering), and options for service level upgrading (with associated payment) if this is seen to be a priority.
- 6) Design facilities, with options.
- 7) Discuss options with Local PSC.
- 8) Discuss options with the Project Execution Group.

(c) Present Options to the Community.

The design options should be presented to the community. In this way the beneficiaries are empowered to make planning decisions, and also to take ownership of the development.

- 1) Workshop options with community, and determine way forward.
- 2) Discuss implications of project implementation, including management, operations and maintenance and cost recovery.
- 3) Obtain an unambiguous mandate to proceed, and a commitment to support the project in terms of management resources and payment for services.

(d) Plan Water Supply Management System and Process

This task is to assist the community to plan for the management of the water supply system, including recovery of costs. If a viable procedure is already in place, this will not be disturbed. Existing structures will form the core of the system.

- 1) Assess needs and technical requirements.

- 2) Assist existing skills and organisational resources.
- 3) Assess training needs and identify training providers.
- 4) Design training programme.
- 5) Identify, form, and mandate a task group to take the management system planning process further. This task group must work very closely with local government and other key interests.

(e) Plan Operations and Maintenance System and Process

This task is to assist the community to plan for the operation and maintenance of the water supply system. If a viable procedure is already in place, this will not be disturbed. Existing structures will form the core of the system.

- 1) Assess needs and technical requirements.
- 2) Assist existing skills and organisational resources.
- 3) Assess training needs and identify training providers.
- 4) Design training programme.
- 5) Identify, form, and mandate a task group to take the management system planning process further. This task group must work very closely with local government and other key interests.

(5) Implementation (Ga-Rasai and Bapong)

In this stage, implementation of the infrastructural development (if any) takes place. The stage will also see the continuation of capacity building and communication programmes, and the continued development of structures and systems for water management (and cost recovery), and operations and maintenance.

(a) Detailed Design and Preparation of Tender Documentation (if required).

- 1) Revision and refinement of preliminary designs.
- 2) Further technical work, if required.
- 3) Prepare tender documentation. In discussion with the Local PSC, this should provide opportunities for local contractors and sub-contractors. The tender documentation must follow DWAF and RDP guidelines regarding affirmative action and labour-based construction.
- 4) Discuss tender documentation with Local PSC and Project Execution Group, and obtain a mandate to proceed.

(b) Appoint Contractors (if required).

- 1) Advertise according to DWAF/RDP guidelines.
- 2) Develop adjudication criteria and process in consultation with Local PSC (according to DWAF/RDP guidelines).
- 3) Adjudicate submissions and appoint contractors. The Local PSC must be consulted on the selection, and must support the final decision.

- 4) Brief contractors (PSC and JICA project team).
- 5) Agree project management roles and responsibilities with the PSC.

(c) Project Management of Contracts (if required).

- 1) Implement agreed project management process.
- 2) Ensure compliance with conditions regarding local involvement.

(d) Monitor and Evaluate Training Associated with Contract Execution (where appropriate).

The execution of the contract provides opportunities for local people to obtain skills. Such training will be a requirement of the contract, but must be monitored and evaluated.

- 1) Responsible Local PSC member to set up a monitoring schedule and criteria.
- 2) Monitor trainees, and identify support where needed.
- 3) Arrange post-training vocational counselling.
- 4) Prepare training evaluation report.

(e) Best Practice and Systems Workshop

In order to share pilot project experiences, and to evaluate best practice before the implementation of water supply management and operations and maintenance systems, a workshop under the auspices of the Project Implementation Forum should be held. The workshop will be part of the capacity building mandate of the Project Execution Group, and will explore ongoing supportive relationships between the pilot communities and bodies such as MW and the District Councils.

- 1) Identify and invite interested parties.
- 2) Brief Local PSCs on presentations.
- 3) Prepare presentations.
- 4) Hold workshop.
- 5) Prepare a report (manual) for wider circulation.
- 6) Incorporate relevant findings

(f) Install Water Supply Management System and Process

The task team established to plan this process should now activate the plan. The task team will have worked closely with local government and other key interests, and should have been mandated by these actors to proceed. Local government should, in most cases, take responsibility for implementing the plan.

- 1) Finalise arrangements with local government.
- 2) Install organisational system, procedures, technical resources and financial arrangements.

- 3) Agree and install reporting and monitoring structures, and an agreed code of community accountability.

(g) Install Operations and Maintenance Management System and Process

The task team established to plan this process should now activate the plan. The task team will have worked closely with local government and other key interests, and should have been mandated by these actors to proceed. Local government should, in most cases, take responsibility for implementing the plan.

- 1) Finalise arrangements with local government.
- 2) Install organisational system, procedures, technical resources and financial arrangements.
- 3) Agree and install reporting and monitoring structures, and an agreed code of community accountability.

(h) Project Commissioning and Handover

- 1) Commissioning ceremony.
- 2) Preparation and handover of commissioning manuals/documentation.
- 3) Detailed briefing of post-commissioning managers.

(i) Evaluation and Completion Report

- 1) Formulate structure.
- 2) Prepare draft report.
- 3) Present report.
- 4) Finalise.

10.4.3 Responsibilities

As with Phase 2, it will be important to allocate roles and responsibilities in Phase 3. In this case, responsibilities are clear, in that Local PSC's will oversee each of the Pilot Projects. Budgetary allocations, tender documentation and the appointment of contractors will have to be discussed by the PEG and rectified by the PMC.

Post-Phase 3 responsibilities for pilot projects are a matter that should be discussed during overall set-up. In general it is proposed that such responsibility is taken on by the appropriate 3rd Tier body, if the necessary capacity exists.

10.4.4 Schedule

The scheduling of Phase 3 is shown in Figure 10-7. Points of note are that:

- Phases 2 and 3 will proceed simultaneously.

- The task of eliciting community involvement will begin as soon as possible (but only once the pilot projects have been confirmed).
- Various capacity building tasks will continue throughout the Phase.
- Surveying and mapping will start in February to facilitate early progress with planning. The relevant approval will be sought during programme set-up activities.

10.4.5 Implementation Structure

A Phase 3 Working Group is proposed, along the lines of a similar structure for Phase 2.

Characteristics are :

- Membership will include members of the Study Team, Local Consultants and seconded individuals from key organisations as appropriate.
- The group will be multi-disciplinary.
- Task will include planning and co-ordinating the work, information gathering and analysis, supervision of local consultants, facilitating the activities of the Local PSC's, reporting to the Project Execution Group, and preparing required documentation and reports.
- The Phase 3 Working Group will facilitate communication of pilot project activities via the Project Execution Forum.

Table 10-1 Priority Project Selection

Supply Zone	Supply Area	No of Supply Block	Incremental Water Demand per Capita, between 1995 (m ³ /c/yr)		Project Cost per Capita (Rand/person)			Remark
			2002	2015	Bulk Water	Reticulation	Total	
Western	Vaalkop North (Overall)	6	23	50	1,410	606	2,016	
	Vaalkop North (Accelerated Area)	(4)	(18)	(17)	(1,529)	(1,156)	(2,685)	
	Vaalkop South	2	24	38	840	500	1,340	
	Barnardsvlei	2	18	30	24	105	129	
	Koster	2	2	5	39	105	144	
Central	Brits	2	26	52	276	260	536	
	Klipvoor (Overall)	3	18	18	983	656	1,639	
	Klipvoor (Accelerated Area)	(3)	(18)	(18)	(1,047)	(698)	(1,745)	
	Rand Water	1	14	26	31	176	207	
	Temba	4	9	19	128	113	241	
Eastern	Weltevreden (Overall)	4	10	14	186	570	756	
	Weltevreden (Accelerated Area)	(1)	(18)	(30)	(846)	(1,330)	(2,176)	
	Bronkhorstspuit	2	5	12	82	337	419	

Table 10-2 Selection of Pilot Projects

Discription	Twecfontein North	Twecfontein East	Schoke	Kameelboom	Ga-Rasai	Klipgat	Bapong
1. Status of the Community							
1.1 Supply Zone	Eastern Highveld Peri - Urban	Eastern Highveld Peri - Urban	Eastern Highveld Rural	Western Rustenburg Rural	Western Eastern Rural	Central Eastern Peri - Urban	Central Eastern Peri - Urban
1.2 District Council	1,300	13,000	1,100	2,000	600	16,000	9,000
1.3 Community	Need	Exist	Need	Need	Exist	Exist	Exist
1.4 Population	56.8	35.5	46.8	83.1	30.3	43.1	25.9
1.5 Infrastructure							
1.6 Project Cost							
2. Outline of the Project							
2.1 Priority of the Project	3	1	3	3	2	1	1
2.2 Difficulty of Treatment	2	1	2	3	1	1	1
2.3 Infrastructure (New)	3	-	3	3	-	-	-
2.4 Infrastructure (Improved)	-	2	-	-	2	2	2
2.5 Facility Size	2	1	2	2	3	2	2
2.6 Community Leader	2	2	3	3	2	2	2
2.7 Poverty	2	1	3	3	3	2	1
2.8 Community Development Plan	2	3	2	3	2	2	3
2.9 Cooperation of Villages	2	2	3	3	3	2	2
2.10 Total Points	18	13	21	23	18	14	14
Priority	3	7	2	1	3	5	5

Note:

Point 3: Good or High

Point 2: Moderate

Point 1: Poor or Low

TABLE 10-3 : FEASIBILITY STUDY ROLES AND RESPONSIBILITIES : FEBRUARY 1997 - OCTOBER 1997

This is for illustrative purposes only. Roles and responsibilities will need to be agreed by the parties.

TASK / ACTIVITY	Magalies Water	District Councils	DWAF Central	DWAF Regional	Study Team	Local Consultants
2.1 Initial Set-up						
2.1.1 Mobilising Participants	Leadership	Participation	Co-ordination	Responsibility	Facilitation	
2.1.2 Communication Strategy	Leadership	Participation	-	Responsibility	Preparation	
2.1.3 Feasibility Study Project Management	Leadership	-	-	Participation	Responsibility Secretariate	
2.2 Feasibility Study						
2.2.1 Supplementary data collection	-	-	-	-	Responsibility Supervision	Sub-Contracted
2.2.2 Population and Water demand surveys	-	-	-	-	Responsibility Execution	
2.2.3 Preliminary design	Responsibility Participation	Participation	-	-	Execution	Sub-Contracted
2.2.4 Final Capital Investment plan	-	-	Responsibility	-	Execution	
2.2.5 Project(s) Institutional Requirements	Leadership	Participation	-	Responsibility	Execution	
2.2.6 Initial Environmental Impact Assessment	-	-	-	Responsibility	Supervision	Sub-Contracted
2.2.7 Project Implementation Plans	Leadership	Participation	Co-ordination	Responsibility	Execution	
2.2.8 Feasibility Report	Participation	Participation	Participation	Participation	Preparation	
2.3 Implementation of Organisational Change	Leadership Responsibility	Participation	Participation	Participation	Facilitation	

TABLE 10-4 : FEASIBILITY STUDY ROLES AND RESPONSIBILITIES : 1998- 2002

This is for illustrative purposes only. Roles and responsibilities will need to be agreed by the parties.

TASK / ACTIVITY	Magalies Water	District Councils	DWAF Central	DWAF Regional	Study Team	Local Consultants
1. Infrastructure Development						
1.1 Accelerated Projects					No Role	As Required
1.1.1 Funding Arrangement	Participation	Participation	Responsibility		"	"
1.1.2 Detailed Design	Responsibility	Responsibility			"	"
1.1.3 Implementation	Participation	Responsibility			"	"
1.1.4 Monitoring/Post Pj. Evaluation	Participation	Responsibility			"	"
1.2 Ordinary Project (Stage 1)					"	"
1.2.1 Funding Arrangement	Participation	Participation	Responsibility		"	"
1.2.2 Detailed Design	Responsibility	Responsibility			"	"
1.2.3 Implementation	Participation	Responsibility			"	"
1.2.4 Monitoring/Post Pj. Evaluation	Participation	Responsibility			"	"
2. Institutional Development						
2.1 Role & Responsibility Setting	Responsibility	Responsibility	Responsibility	Responsibility	"	"
2.2 2 nd Tier Restructuring	Responsibility			Participation	"	"
2.3 3 rd Tier Support/Strengthening	Participation	Responsibility		Participation	"	"

TABLE 10-5 : FEASIBILITY STUDY ROLES AND RESPONSIBILITIES : 2003 - 2015

This is for illustrative purposes only. Roles and responsibilities will need to be agreed by the parties.

TASK / ACTIVITY	Magalies Water	District Councils	DWAF Central	DWAF Regional	Study Team	Local Consultants
1. Ordinary Projects (Stage 2)						
1.1 Funding Arrangement	Participation	Participation	Responsibility		No Role	As Required
1.2 Detailed Design	Responsibility	Responsibility			"	"
1.3 Implementation	Participation	Responsibility			"	"
1.4 Monitoring/Post Pj. Evaluation	Participation	Responsibility			"	"
2. Ordinary Project (Stage 3)						
2.1 Funding Arrangement	Participation	Participation	Responsibility		"	"
2.2 Detailed Design	Responsibility	Responsibility			"	"
2.3 Implementation	Participation	Responsibility			"	"
2.4 Monitoring/Post Pj. Evaluation	Participation	Responsibility			"	"

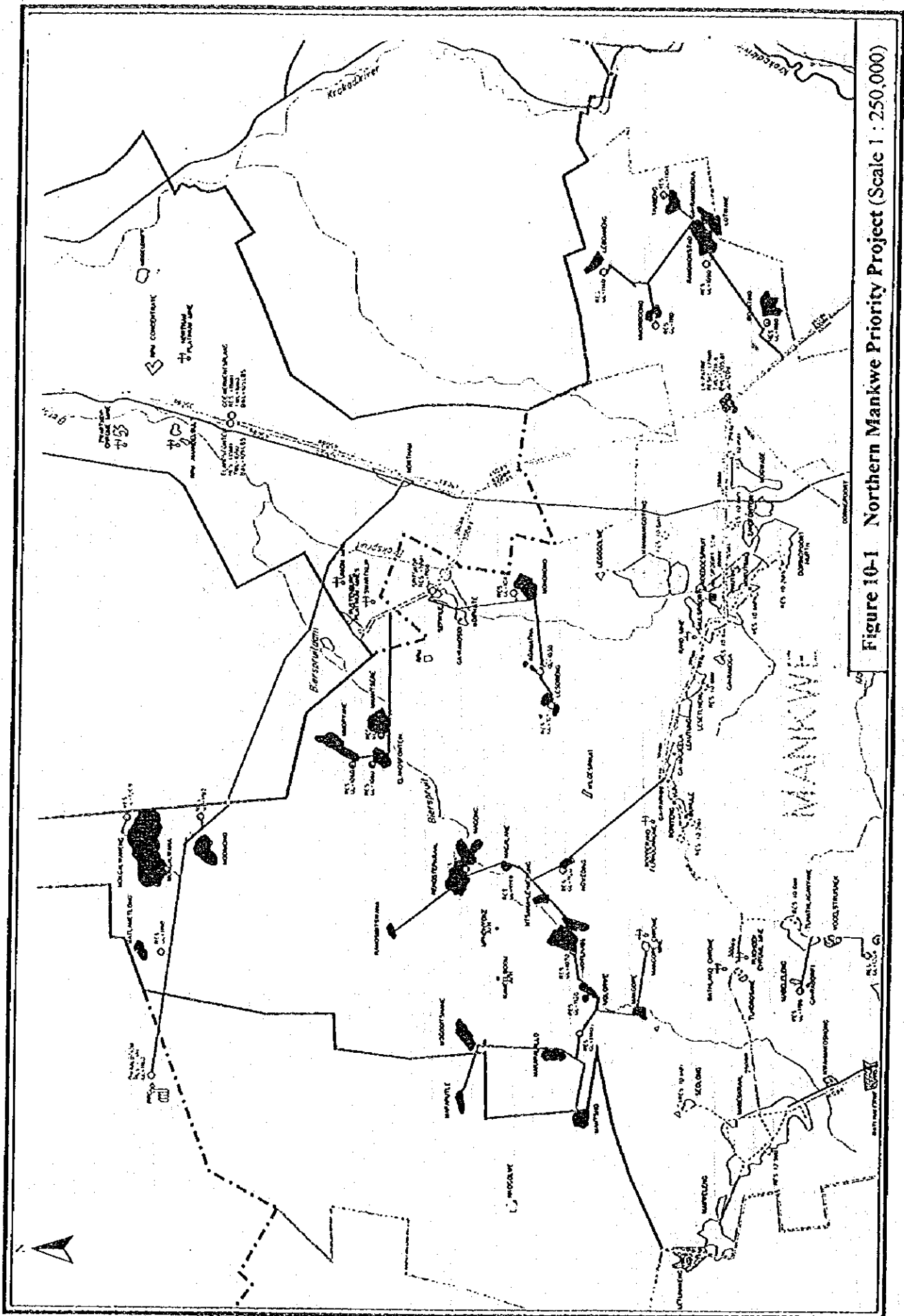


Figure 10-1 Northern Mankwe Priority Project (Scale 1 : 250,000)

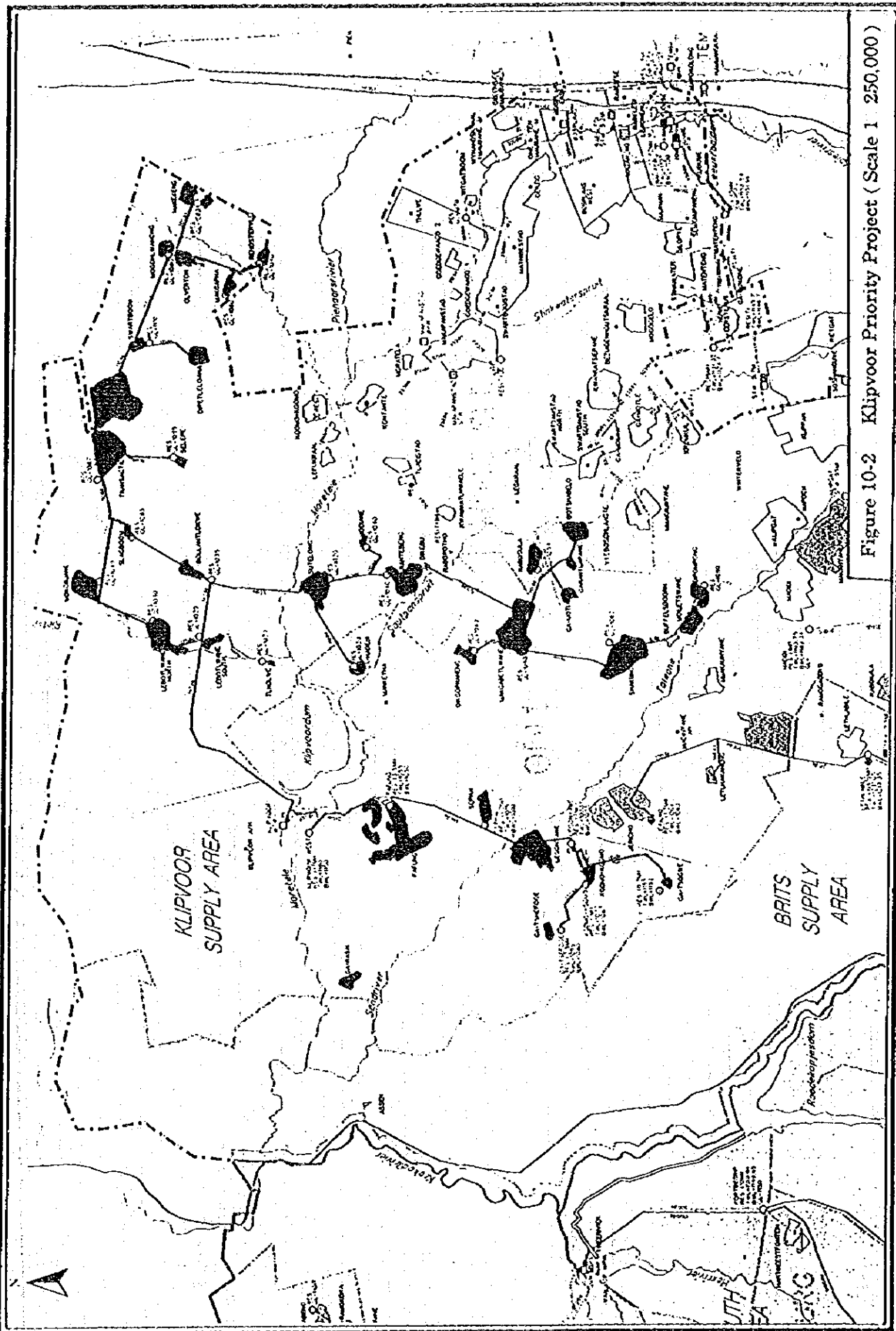


Figure 10-2 Klipvoort Priority Project (Scale 1:250,000)

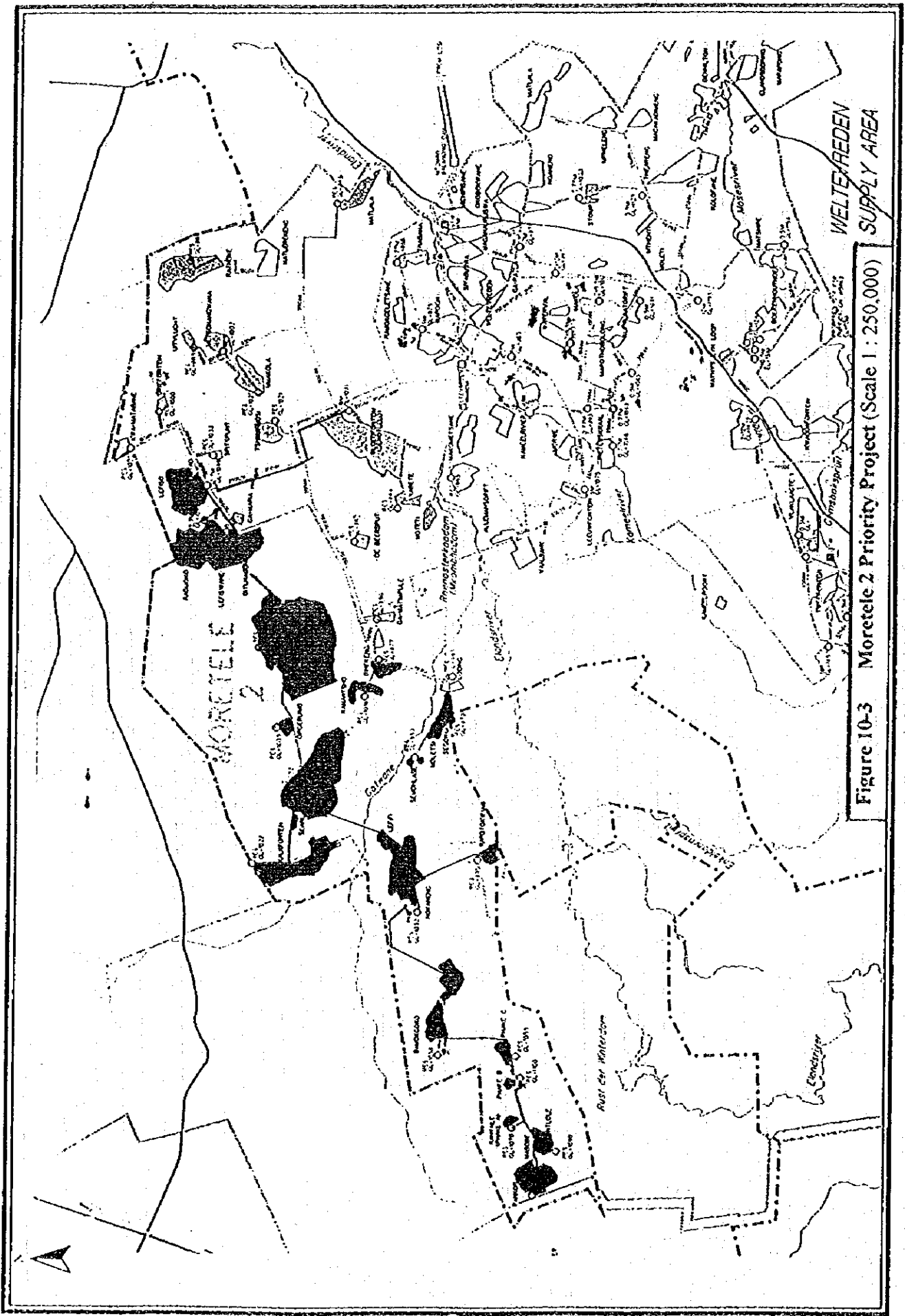


Figure 10-3 Moretele 2 Priority Project (Scale 1 : 250,000)

Figure 10-4 : Proposed Phase 2/ Phase 3 Management Structure

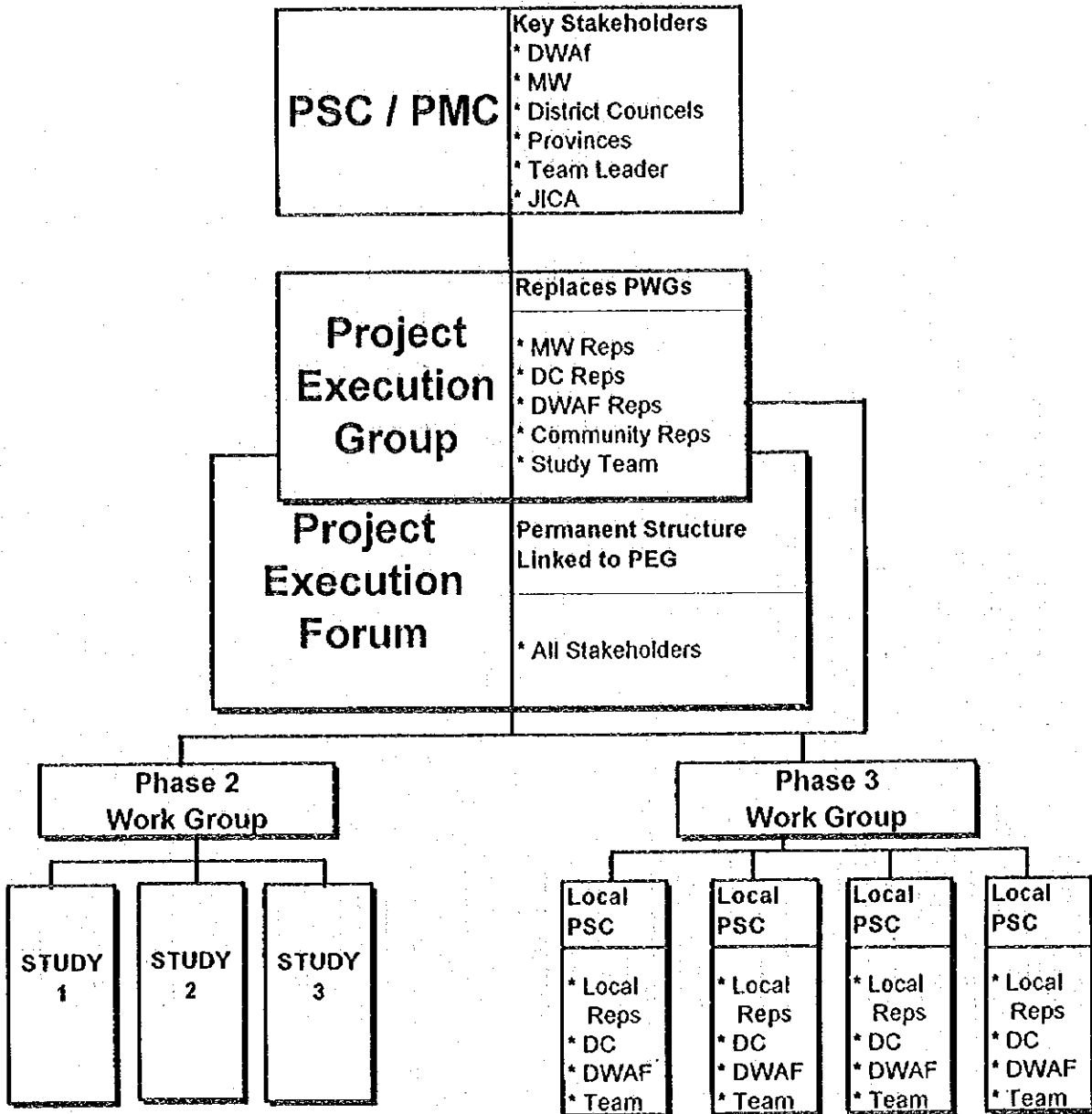


Figure 10-5 : Proposed Set-up Schedule

Detailed Activities	1997										JICA Study Team	DWAF	Magalies Water	District Council	Community	
	1	2	3	4	5	6	7	8	9	10						
1 Programme Set-Up																
1.1 Mobilising Participant																
1.2 Management / Coordination Str.																
1.3 Communication Strategy																
1.4 Verification of Pilot Project																

○ Main Agent
 △ Assisting Agent

Figure 10-6 : Implementation Plan of Feasibility Study

Detailed Activities	1997										JICA	DWAf	MW	DC	CO
	1	2	3	4	5	6	7	8	9	10					
1 Feasibility Study Set-Up															
1.1 Determine Key Players															△
1.2 Form E/S Working Group Coord. C.															△
1.3 Confirmation of Scope / Task															△
1.4 Allocate Roles / Responsibilities															△
1.5 Detailed Work Schedule															△
2 Communication Strategy															
2.1 Determine Needs															○
2.2 Formulate Strategy															○
2.3 Allocate Responsibility															△
2.4 Develop Schedule															○
3 Feasibility Study Project Manag.															
3.1 Monitoring Progress															△
3.2 Feasibility Study Meetings															△
3.3 Reporting															△
3.4 Secretariate Support															○
4 Supplementary Data Collection															
5 Project Formulation															△
6 Population / Water Demand															△
7 Preliminary Design															△
8 Cost / Benefit Estimate															△
9 Boundary Issues Finalisation															△
10 Operation / Maintenance Plan															△
11 Capital Investment Plan															△
12 Project Institutional Requirements															△
13 Initial Environmental I-A															○
14 Project Implementation Plan															△
15 Feasibility Report															△
16 Implementation of Organisational Change															△
17 Workshop															○

△ Assisting Agent

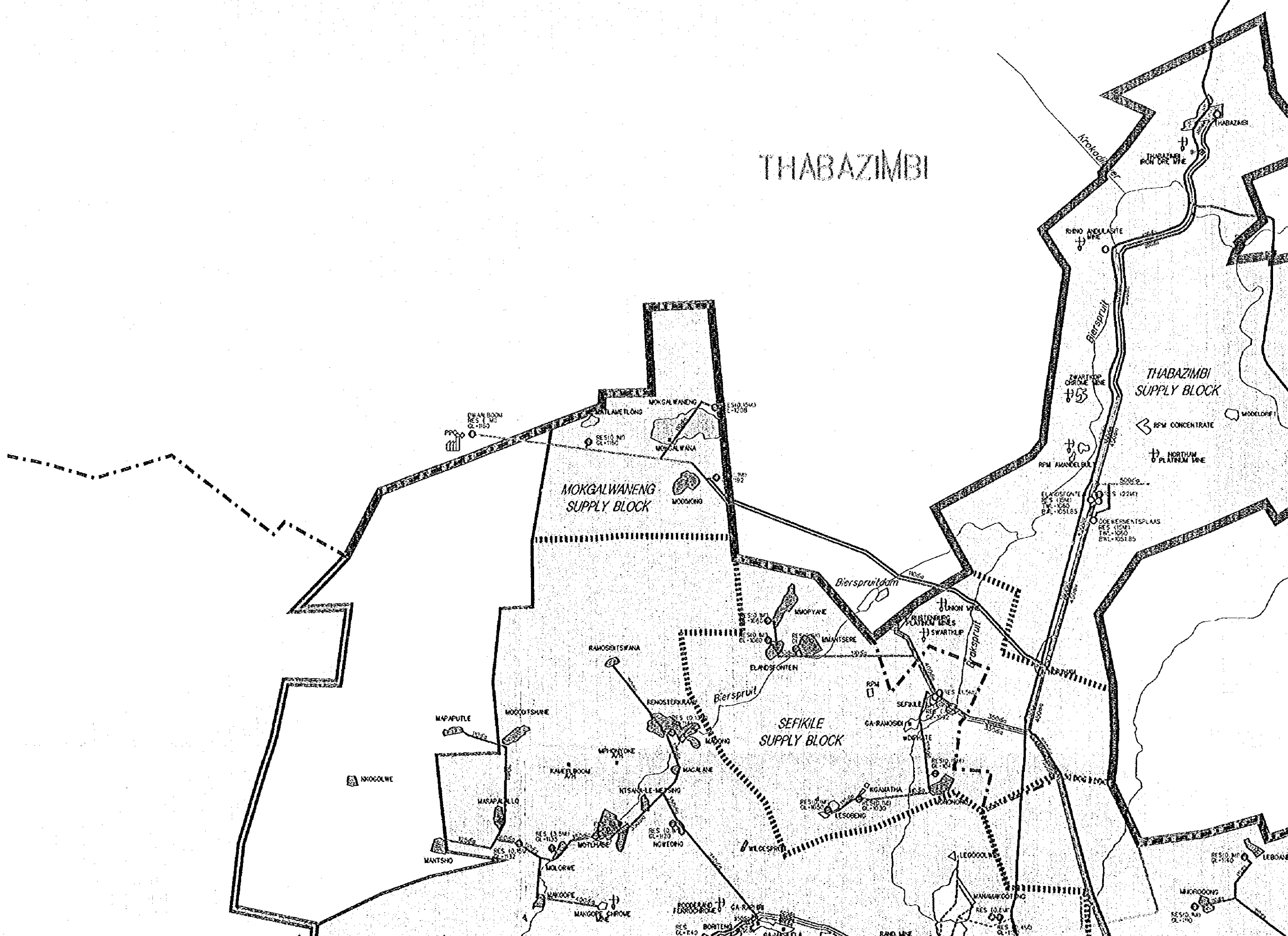
○ Main Agent

Figure 10-7 : Implementation Plan of Pilot Projects

Detailed Activities	1997										JICA Study Team	DWAFF	Magalies Water	District Council	Community (PSC)
	1	2	3	4	5	6	7	8	9	10					
1 Pilot Project Set-Up															
1.1 Elicit Community Involvement															
1.2 Needs Evaluation															
1.3 Project Management Structure															
1.4 Communities Strategy															
1.5 Capacity Building Program															
1.6 Pilot Project Workshop															
2 Planning															
2.1 Survey and Mapping															
2.2 Preliminary Design															
2.3 Present Options to Community															
2.4 Plan Water Management System															
2.5 Plan O.M System															
3 Implementation															
3.1 Detailed Design / Tender															
3.2 Appoint Contractor															
3.3 Project Management of Contracts															
3.4 Monitor / Evaluate Training															
3.5 Best Practice / System Workshop															
3.6 Water Supply Management															
3.7 O&M Management															
3.8 Project Commissioning															
3.9 Evaluation / Completion Reps															

○ Main Agent
 △ Assisting Agent

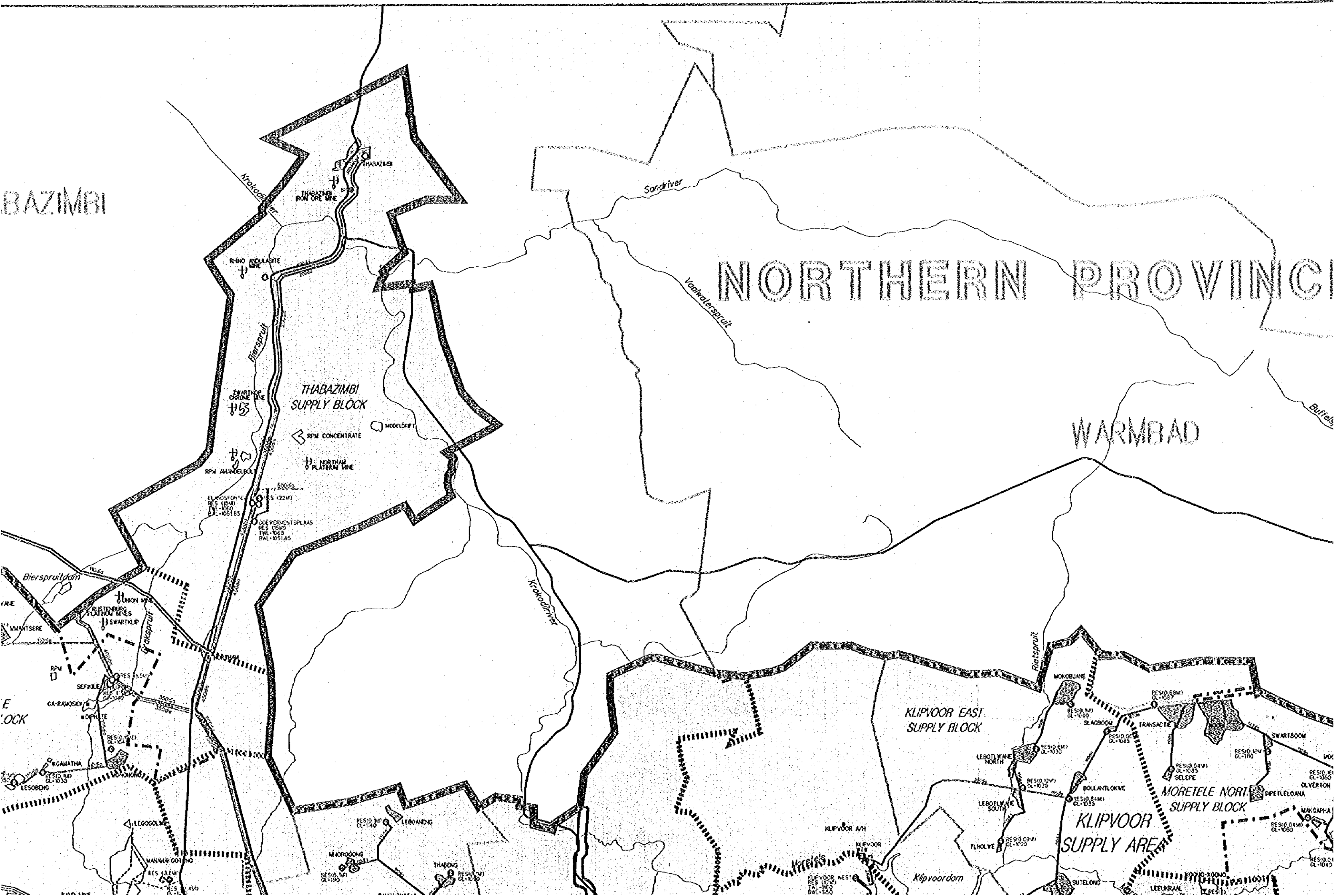
THABAZIMBI



THABAZIMBI

NORTHERN PROVINCE

WARMBAD



THABAZIMBI SUPPLY BLOCK

KLIPVOOR EAST SUPPLY BLOCK

KLIPVOOR SUPPLY AREA

MORETELE NORT. SUPPLY BLOCK

Krokodier

Sandriver

Vanwaterspruit

Krokodier

Rietspruit

Klipvoordam

RHINO INDUSTRIAL

THABAZIMBI IRON ORE MINE

THABAZIMBI ORE MINE

RPM CONCENTRATE

NORTHAM PLATINUM MINE

RPM AMANDELBOEL

EL MOSFOOTE RES (1500) TRL-1060 BUL-1051.85

DOE NORNENT SPLAAS RES (1500) TRL-1060 BUL-1051.85

Bierspruitdam

UNION MINE

RIETSPRUIT PLATINUM MINE

SWARTKOP

SEFKLE

GA-RAMOSDI

BOPIATE

KGAMATHA

LESORDING

LEGOGOLM

MANMAGOOTI

BAVU LINE

RESID 1140

MAPOONG

RESID 1150

THABONG

RESID 1160

KLIPVOOR AM

KLIPVOOR

RES (1170) TRL-1180 BUL-1180

KLIPVOOR WEST

MOKOBANE

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RESID 843 GL-1040

RESID 843 GL-1040

ERN PROVINCE

POTGI

WARMBAD

WATERBERG

WARMBATHS/NYLSTROOM
SUPPLY BLOCK

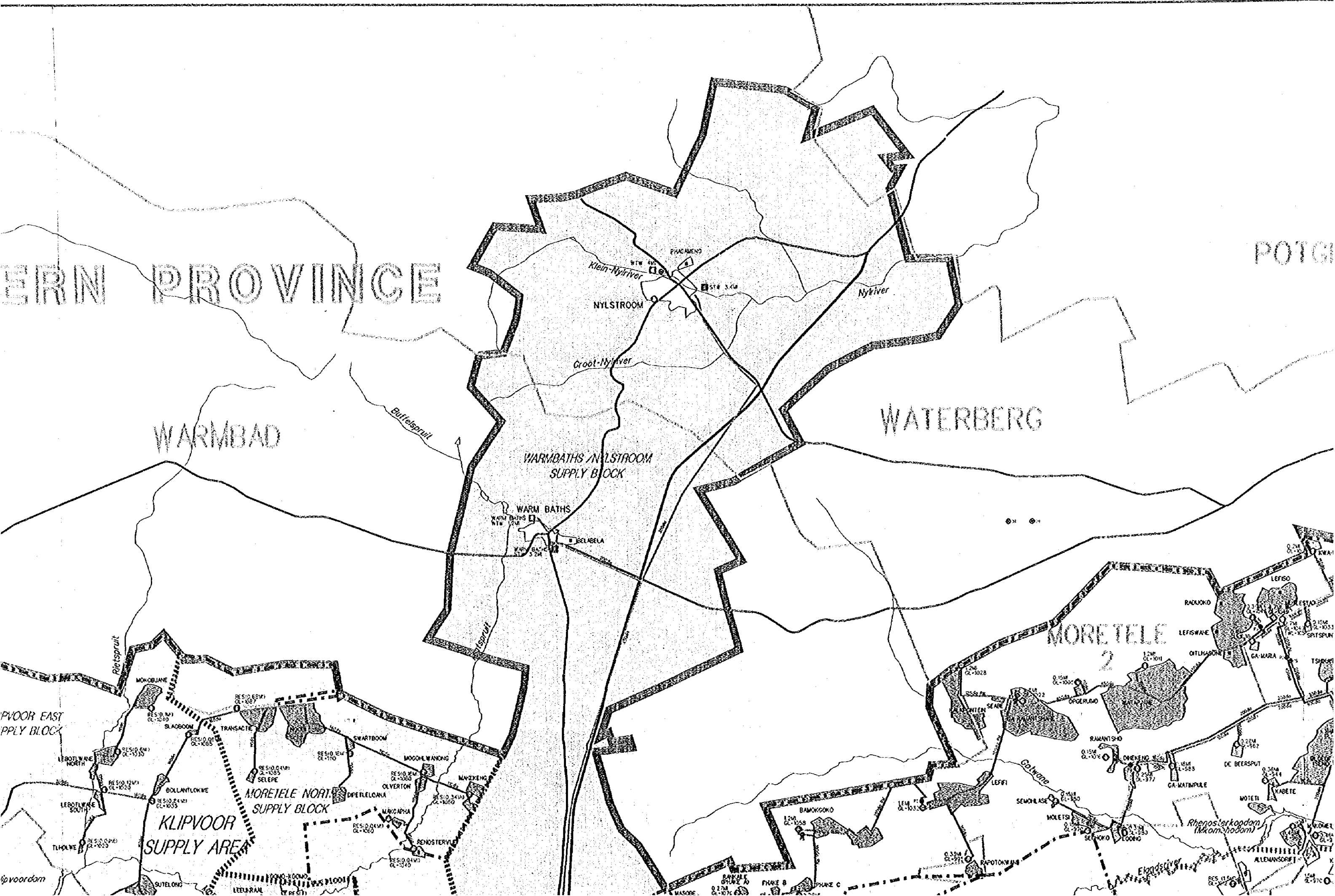
MORETELE

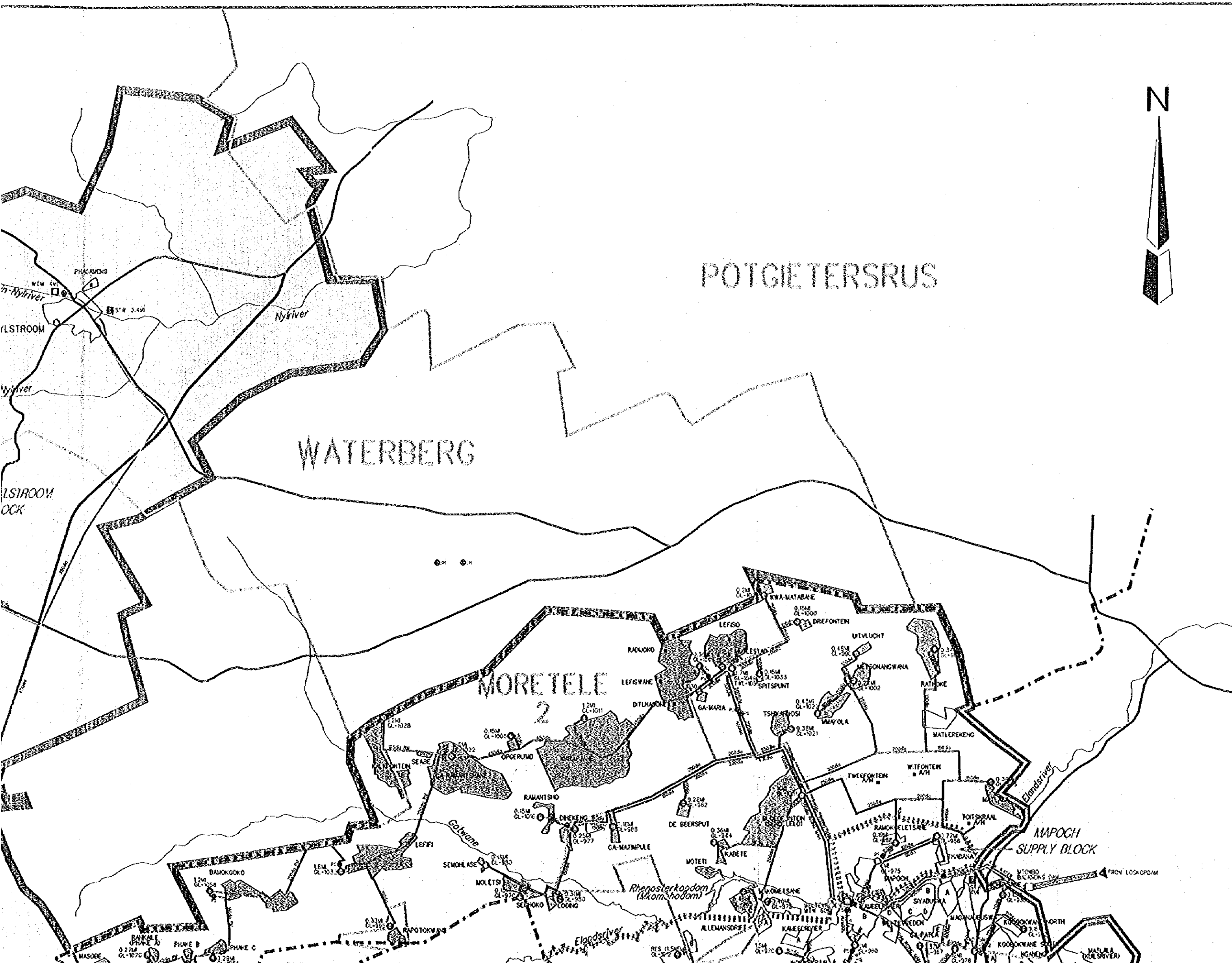
KLIPVOOR
SUPPLY AREA

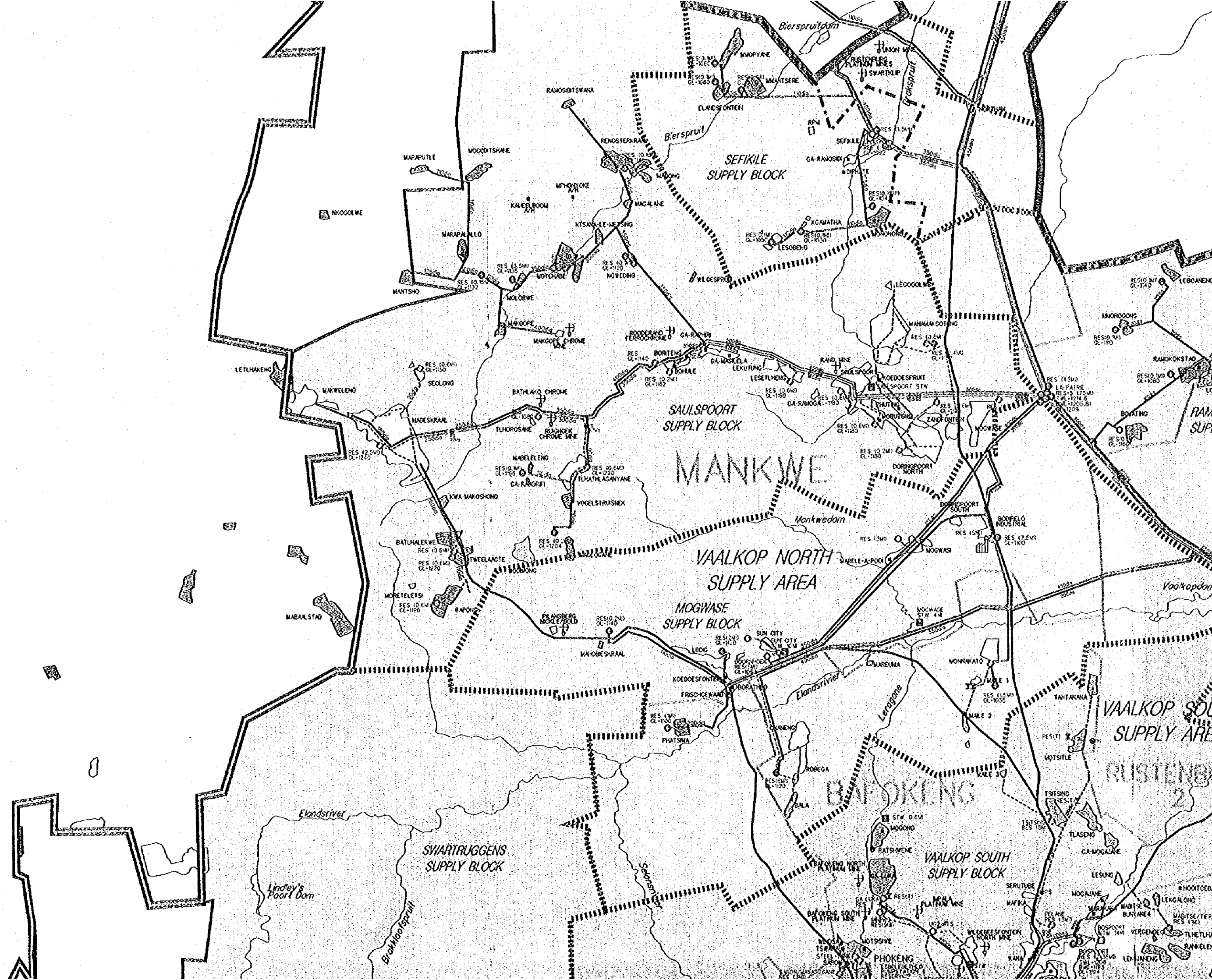
MORETELE NORT
SUPPLY BLOCK

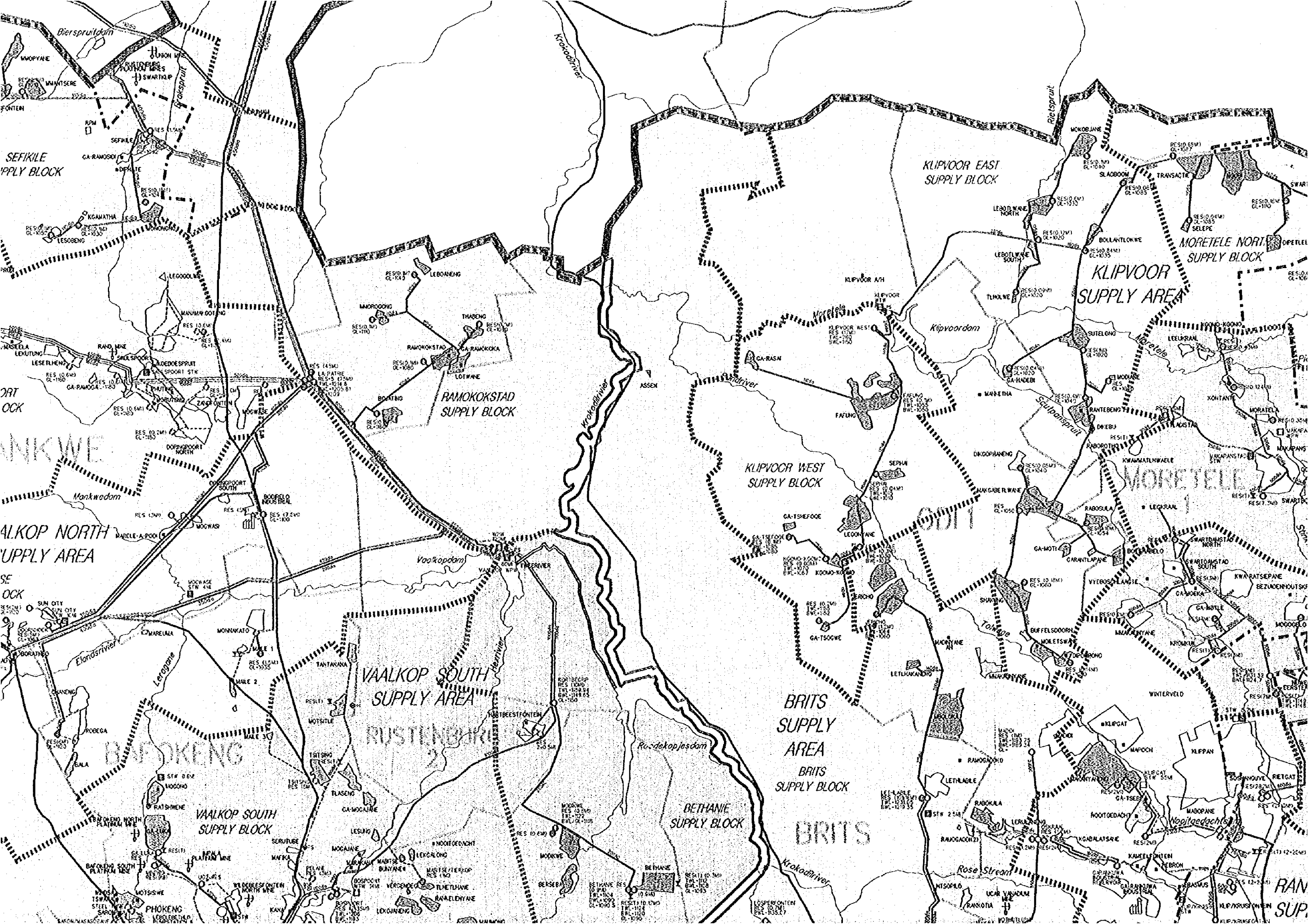
KLIPVOOR EAST
SUPPLY BLOCK

klipvoordom









SEFIKILE
SUPPLY BLOCK

KLIPVOOR EAST
SUPPLY BLOCK

KLIPVOOR
SUPPLY AREA

RAMOKOKSTAD
SUPPLY BLOCK

KLIPVOOR WEST
SUPPLY BLOCK

VAALKOP NORTH
SUPPLY AREA

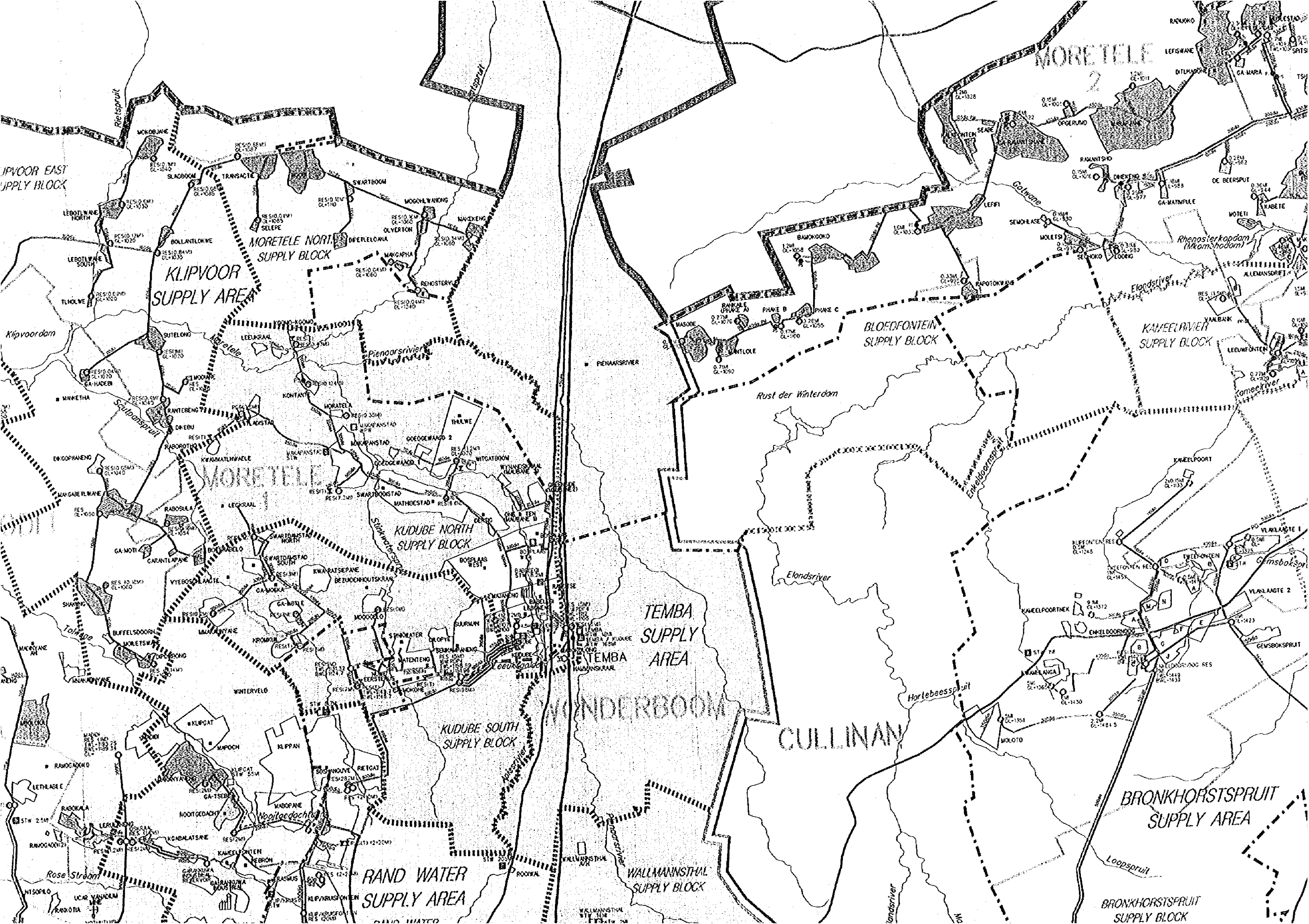
VAALKOP SOUTH
SUPPLY AREA

BRITS
SUPPLY AREA
BRITS
SUPPLY BLOCK

BETHANIE
SUPPLY BLOCK

VAALKOP SOUTH
SUPPLY BLOCK

RAN
SUP.



IPVOOR EAST SUPPLY BLOCK

KLIPVOOR SUPPLY AREA

MORETELE NORTH SUPPLY BLOCK

BLOEDFONTEIN SUPPLY BLOCK

KAMEELRIVIER SUPPLY BLOCK

TEMBA SUPPLY AREA

KUDUBE NORTH SUPPLY BLOCK

KUDUBE SOUTH SUPPLY BLOCK

CULLINAN

RAND WATER SUPPLY AREA

BRONKHORSTSPRUIT SUPPLY AREA

WALLMANNSTHAL SUPPLY BLOCK

BRONKHORSTSPRUIT SUPPLY BLOCK

MORETELE

MORETELE

WANDERBOOM

MORETELE

MORETELE

MORETELE

MORETELE

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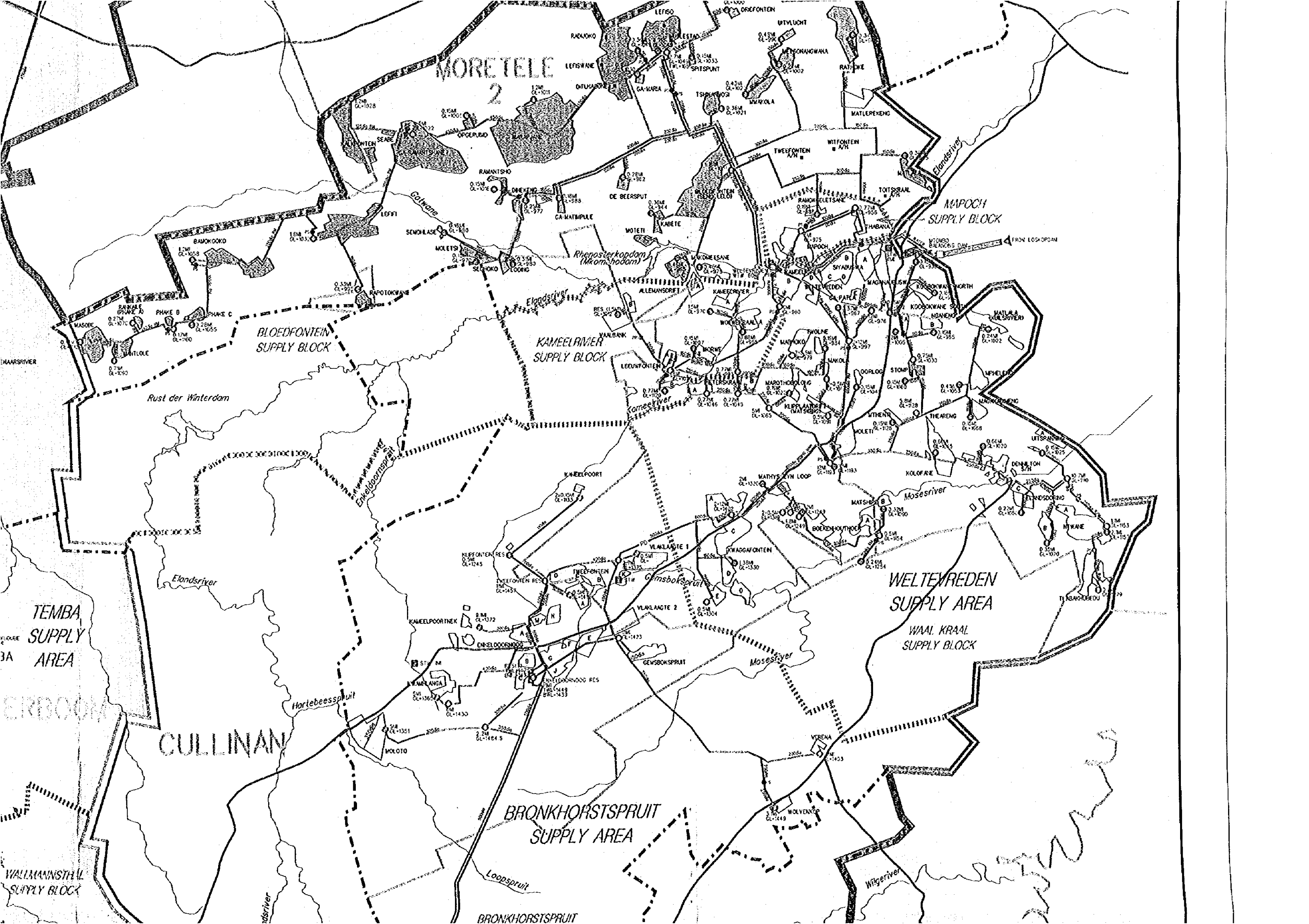
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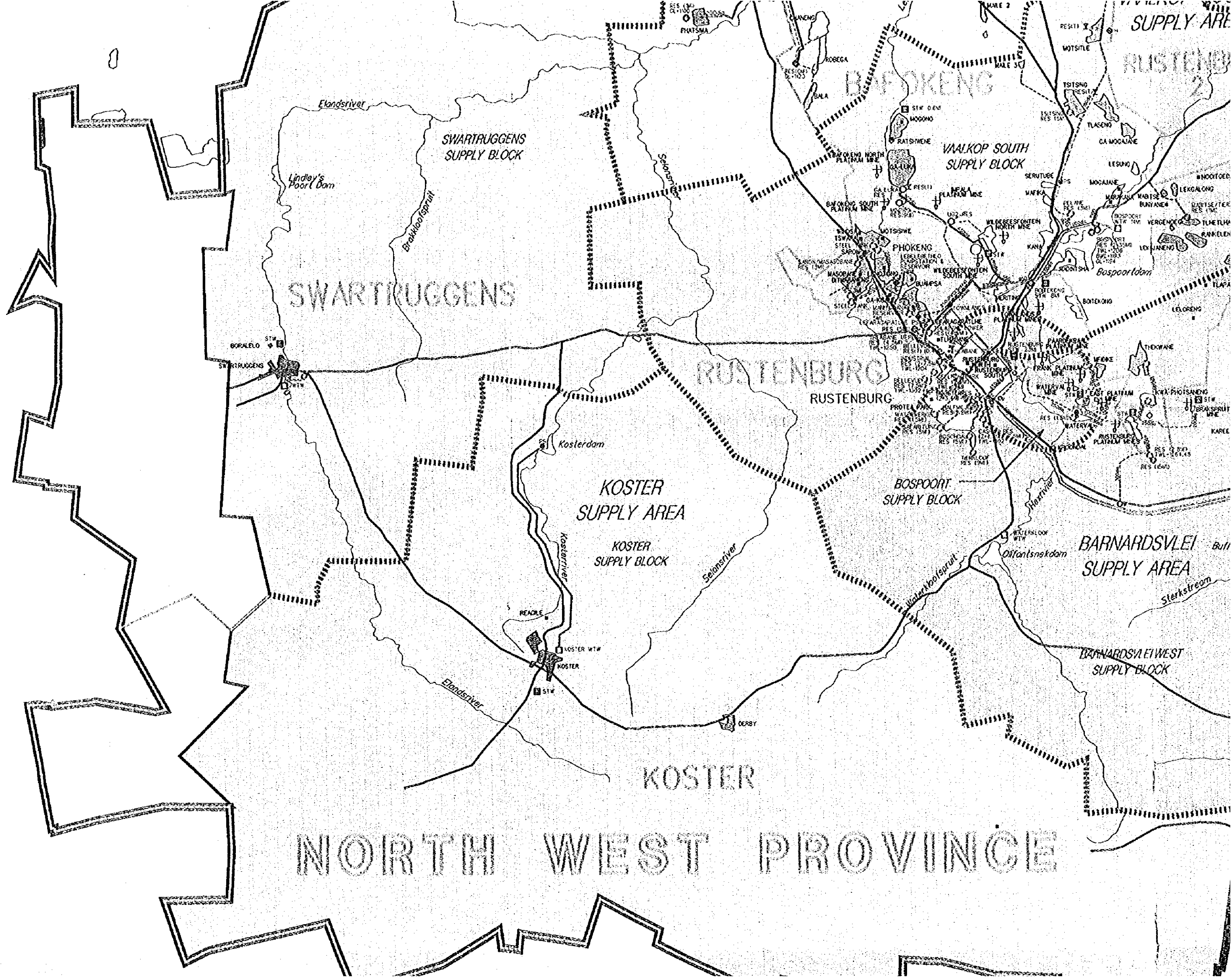
MORETELE

MORETELE

MORETELE

MORETELE





SUPPLY AREA

RUSTENBURG

SWARTRUGGENS SUPPLY BLOCK

VAAKOP SOUTH SUPPLY BLOCK

SWARTRUGGENS

RUSTENBURG

RUSTENBURG

KOSTER SUPPLY AREA

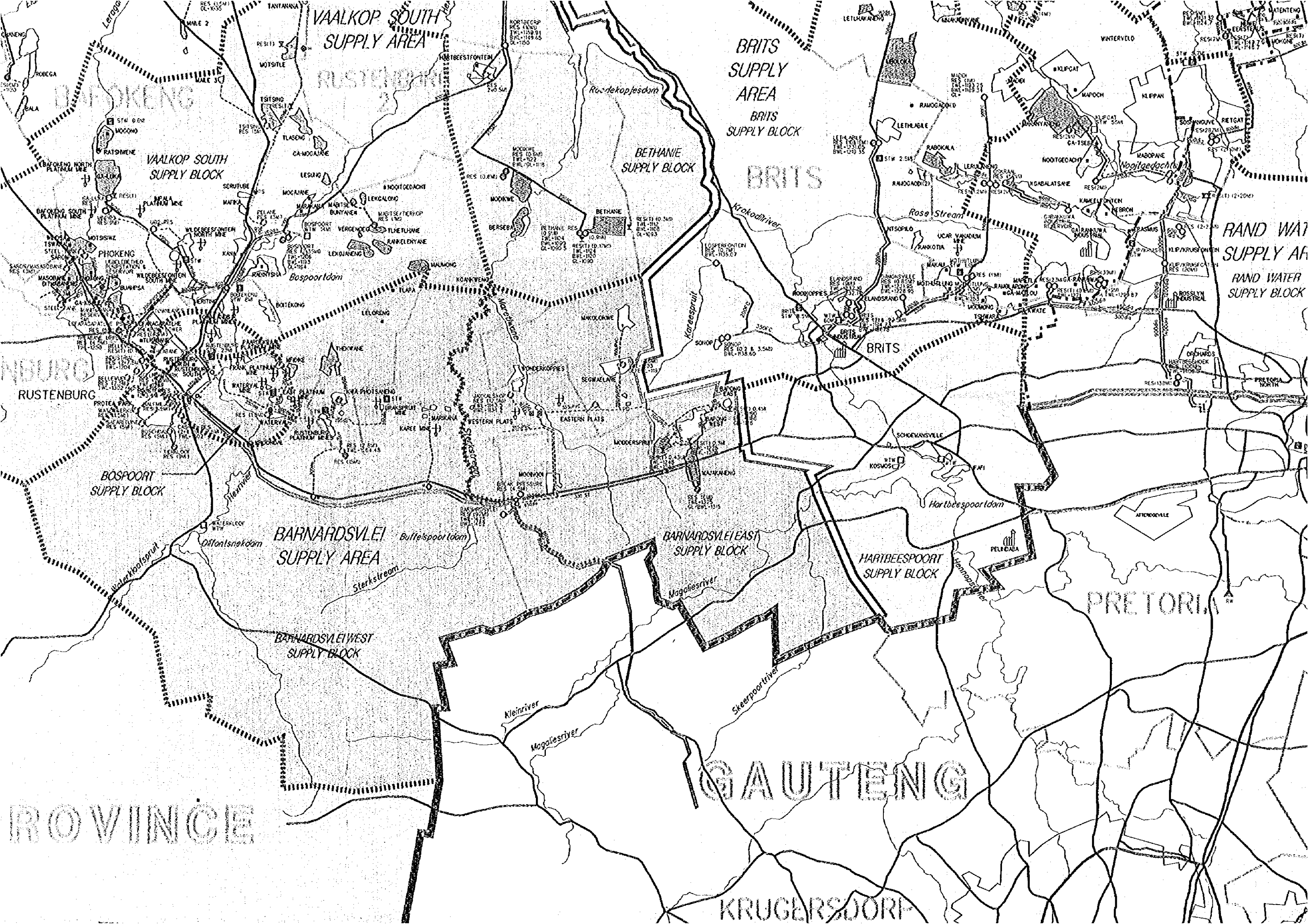
BOSPOORT SUPPLY BLOCK

KOSTER SUPPLY BLOCK

BARNARDSVLEI SUPPLY AREA

BARNARDSVLEI WEST SUPPLY BLOCK

NORTH WEST PROVINCE



VAAKOP SOUTH SUPPLY AREA

BRITS
SUPPLY AREA
BRITS
SUPPLY BLOCK

BETHANIE
SUPPLY BLOCK

RAND WATER
SUPPLY AREA
RAND WATER
SUPPLY BLOCK

BARNARDSVLEI
SUPPLY AREA

BARNARDSVLEI EAST
SUPPLY BLOCK

HARTBEESSPOORT
SUPPLY BLOCK

BARNARDSVLEI WEST
SUPPLY BLOCK

GAUTENG

PROVINCE

KRUGERSDORP

PRETORIA

RUSTENBURG

BOSPOORT
SUPPLY BLOCK

VAAKOP SOUTH
SUPPLY BLOCK

VAAKOP SOUTH
SUPPLY BLOCK

Kleinriver
Magalesriev

Skeerpoortriver

Hartbeespoortdam

Olfontseindam

Buffelspoortdam

Bospoortdam

Rooiwaterdam

Rosa Stream

Krakoalriver

Korrespruit

Peldaba

Venterspruit

Magalesriev

Kleinriver

BARNARDSVLEI EAST
SUPPLY BLOCK

HARTBEESSPOORT
SUPPLY BLOCK

BARNARDSVLEI
SUPPLY AREA

BARNARDSVLEI EAST
SUPPLY BLOCK

HARTBEESSPOORT
SUPPLY BLOCK

BARNARDSVLEI WEST
SUPPLY BLOCK

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BARNARDSVLEI EAST
SUPPLY BLOCK

HARTBEESSPOORT
SUPPLY BLOCK

BARNARDSVLEI
SUPPLY AREA

BARNARDSVLEI EAST
SUPPLY BLOCK

HARTBEESSPOORT
SUPPLY BLOCK

BARNARDSVLEI WEST
SUPPLY BLOCK



SUPPLY AREA

WATERBOOM

CULLINAN

BRONKHORSTSPRUIT SUPPLY AREA

RAND WATER SUPPLY AREA

WALLMANNSTHAL SUPPLY BLOCK

BRONKHORSTSPRUIT SUPPLY BLOCK

RAND WATER SUPPLY BLOCK

CULLINAN SUPPLY BLOCK

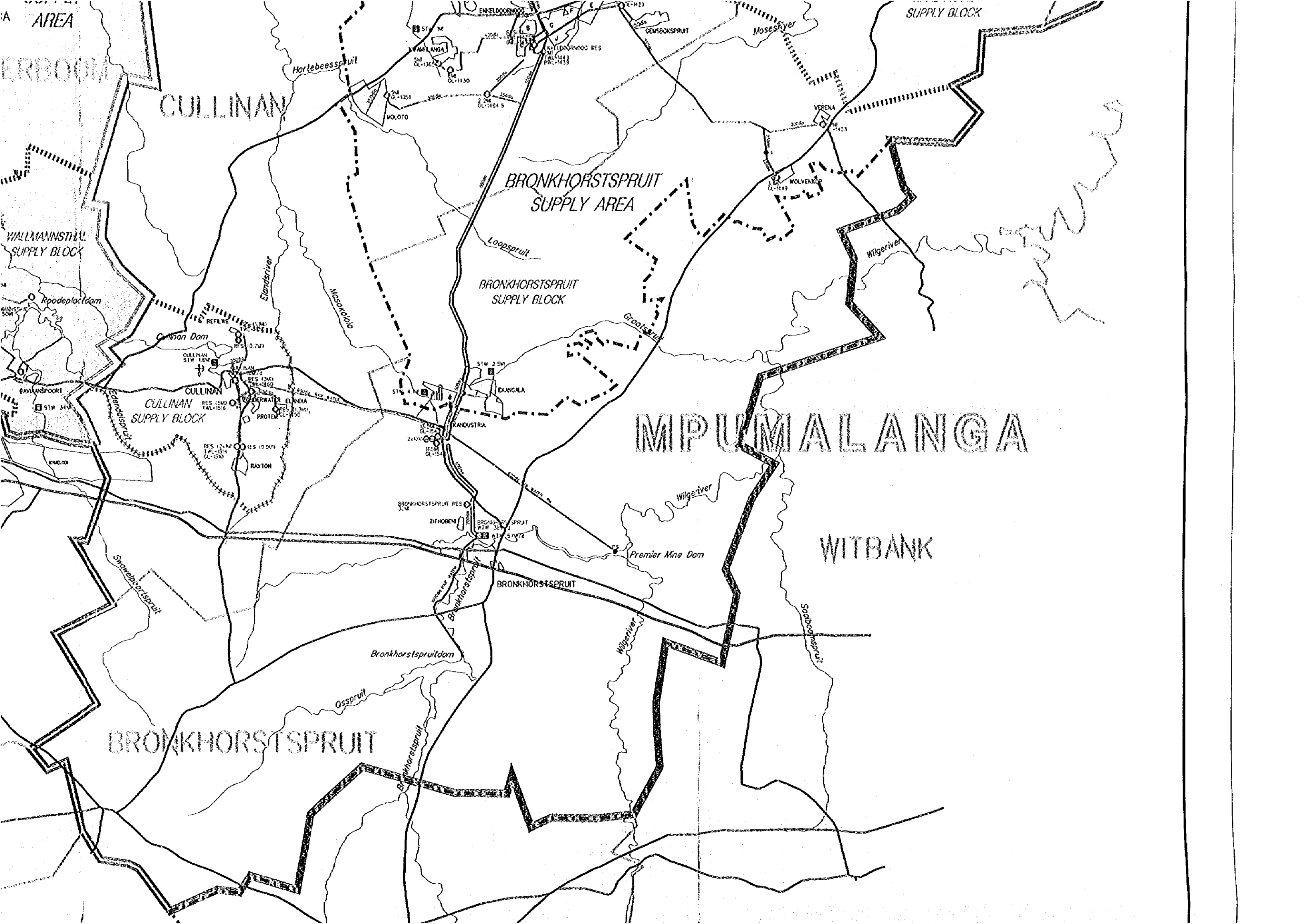
MIPU

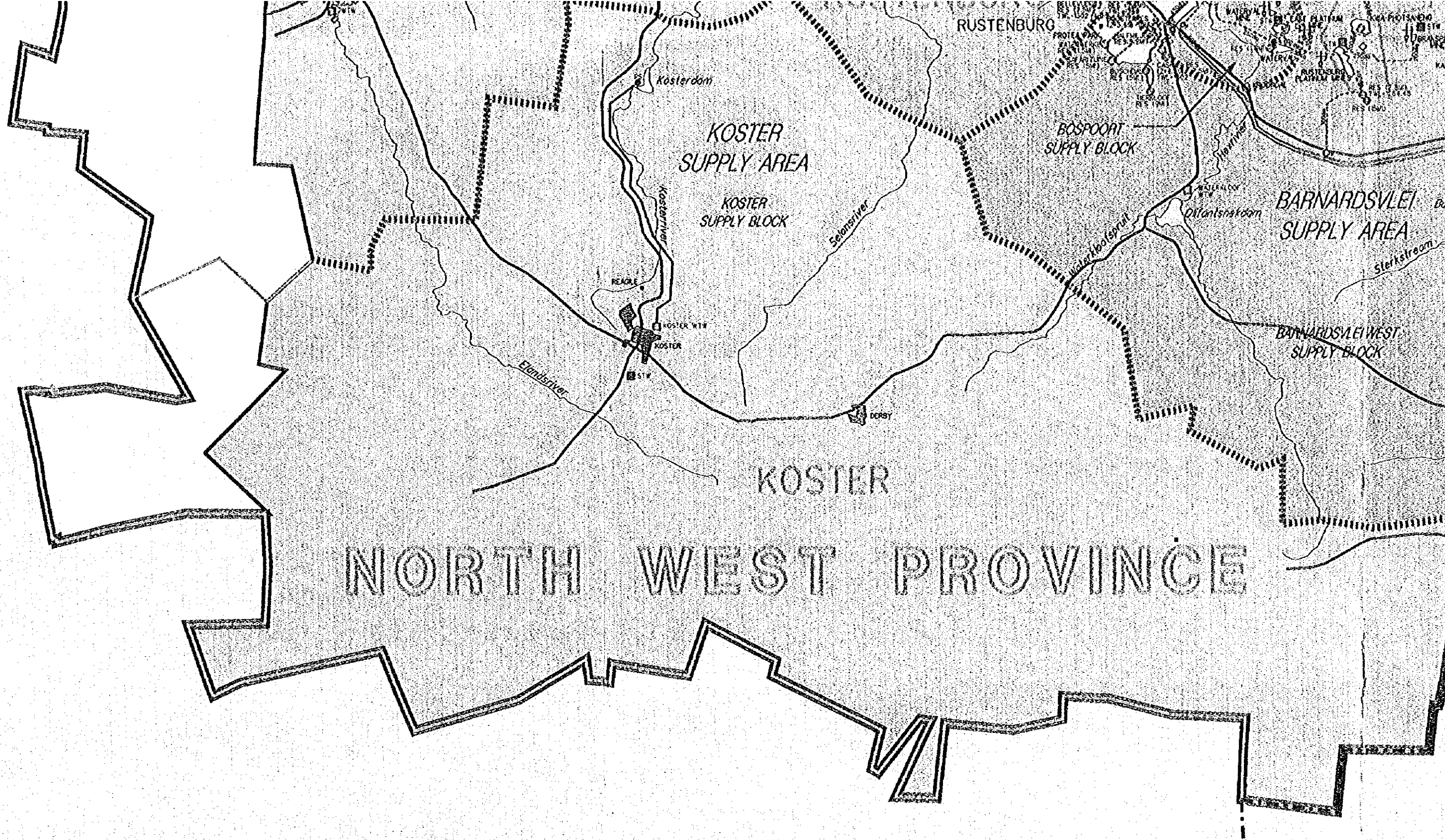
PRETORIA

PRETORIA

BRONKHORSTSPRUIT

NIG





LEGEND :

1. BOUNDARIES

- MAIN ROADS
- RIVERS
- ▭ DAMS
- ▬ CANAL
- ▬ STUDY AREA BOUNDARY
- ▬ PROVINCIAL BOUNDARIES
- ▬ MAGISTERIAL BOUNDARIES

2. TOWNS & VILLAGES SHOWING EX. WATER RESOURCE TYPES

- ▭ NO DATA
- ▭ GROUNDWATER
- ▭ SURFACE WATER
- ▭ TREATED ELSEWHERE
- ▭ GROUNDWATER/ TREATED ELSEWHERE
- ▭ SURFACE WATER TREATED LOCALLY

3.1. PIPELINES (BULK)

- EXISTING PIPELINES
- FIXED PLANNING
- PROPOSED PLANNING

3.2. PIPELINES (SECONDARY)

- EXISTING PIPELINES
- FIXED PLANNING
- PROPOSED PLANNING
- (PD) PROPOSED DISCONNECTION

4.1. RESERVOIRS (BULK)

- ⊙ EXISTING
- ⊙ FIXED PLANNING
- ⊙ PROPOSED PLANNING

4.2. RESERVOIRS (SECONDARY)

- ⊙ EXISTING
- ⊙ FIXED PLANNING
- ⊙ PROPOSED PLANNING

5. WATER TOWERS & PS (SECONDARY)

- ⊙ RES(T) EXISTING TOWER
- ⊙ RES(T) FIXED PLANNING
- ⊙ RES(T) PROPOSED PLANNING

6. METERING POINTS (B)

- ⊙ M EXISTING METERING POINT
- ⊙ M FIXED PLANNING
- ⊙ M PROPOSED PLANNING