

11
1000
ARY

QUESTIONNAIRE

回答書

PRELIMINARY STUDY

ON

RURAL WATER SUPPLY PROJECT

IN

MZIMBA WEST DISTRICT

IN

THE REPUBLIC OF MALAWI

JICA LIBRARY



J 1138378 {3}

MAY 1996

JAPAN INTERNATIONAL COOPERATION AGENCY



1138378 [3]

1. WATER SUPPLY SECTOR

1.5 CURRENT SITUATIONS AND PROBLEMS OF WATER SUPPLY IN BOTH URBAN AND RURAL AREAS

Water supply coverage in Malawi is estimated to be 85 percent in urban areas and 58 percent in rural areas. However these basic coverage estimates have to be considered with caution since there are clear indications of an over estimation of the actual coverage.

Of the 58% of the rural population with access to water, 18% are served by gravity systems, 31% by boreholes and another 9% by shallow wells. Out of these boreholes and wells about 25% are out of operation due to various reasons. As a result of this only 43% of the rural population have an access to an acceptable supply of water on the basis of Government standards for consumption (27l/head/day with a maximum distance of 0.5km to the water source). This represents almost 5 million rural population are at health risk and seriously socially constrained due to inadequate services.

Rapid urbanisation is a cause for concern in water supply to the urban areas. The urban population growth rate is currently estimated at 6.1%. The majority of the urban population growth comprises people migrating from the rural areas. According to estimates in the National Water Master Plan(1986) between 50-80% of urban/semi urban residents lived in peri-urban areas accommodated in 'traditional housing'. These people normally constitute the poorest sector of the urban population and are by far the majority of the urban unserved. The growth rates of some of the peri-urban communities have been estimated to be as high as 15%. This means in addition to those currently unserved about 1.5 to 2.2 million people could be without services by the year 2002.

1.6 Cooperation with the Ministry of Health in the Task of Rural Sanitation and Hygiene Education

In order to execute the task Hygiene Education and Sanitation Promotion following inter ministerial committees are normally set up.

The Project Team:

This is a technical committee comprising project officers based at the headquarters level from the three participating Ministries namely: Mins. of Community Services, Mins of Health and Mins. of Local Government.

This committee is responsible of coordinating inputs from the three collaborating Ministries, coordinating implementation of the project and monitoring progress and reporting.

The District Working Group:

At the District level, representatives from the three collaborating Ministries work hand in hand in support of the project.

This Group provide the necessary guidance to the extension workers to ensure that the project work go on smoothly.

Local Coordinating Teams:

This is a technical committee of extension workers based at the local level. It comprises the Water Monitoring Assistant, Health Assistant and the Community Development Assistant.

The function of this team is dissemination of hygiene messages and promotion of sanitation to communities.

4 National Water Services Development Plan 1994-2010

4.1 Objectives

The National Water Services Development Plan for the period 1994-2010 shall ensure achievement of the political goals and targets and the institutional development objectives outlined in Chapters 2 and 3 above. It shall have four objectives:

- 1) The population of Malawi shall be provided with water services, so that the following population coverage is achieved in the year 2010:

• Public water supply to the population in Lilongwe and Blantyre	100%
• Public water supply to the population in other towns	95%
• Public water supply to the population in rural areas	74%
• Waterborne sanitation and septic tanks in urban areas	24%

- 2) The targets established for population coverage and service levels imply that the following water services shall be delivered in the year 2010:

Water Services System	Persons Served
Urban Type Piped Water Supply System in Lilongwe & Blantyre	1,405,000
Urban Type Piped Water Supply System in other towns	825,000
Gravity Piped Community Managed Water System	2,506,000
Boreholes / Shallow Wells with Handpumps in Lilongwe & Blantyre	705,000
Boreholes / Shallow Wells with Handpumps in other towns	384,000
Boreholes / Shallow Wells with Handpumps in rural areas	6,866,000
Waterborne Sewerage and Septic Tanks in urban areas	800,000

- 3) The tariffs on water services shall gradually be increased in order to avoid uneconomic water projects and to move towards reaching financially self-sufficient sector organizations. Tariff structures shall ensure that:

- The revenues from the financially able consumers are increased
- The necessary subventions are reserved for the poor
- The financial burden on Government is minimized
- Marginal water resources are not being overexploited

- 4) The institutional reform shall be completed, which means that sector management after the year 2000 shall have the following characteristics:

**Figure 4.1 National Water Services Development Plan:
Schedule of Key Actions for Sector Reform during Phases 1 and 2, 1994 - 1999**

Responsibility	Action	Phase 2 Development of Schemes and Water Boards				
		1997	1998	1999	1996	1995
Central Government	1 Cabinet approval of National Water Services Development Plan 1994-2010 2 Finalization of preparation of National Water Development Project 3 Transfer of responsibility for sanitation to the two Water Boards 4 Drafting and adopting of a Water Resources and Water Services Act 5 Establishment of three Regional Water Services Funds 6 Introduction of performance management principles 7 Review of monitoring responsibility for Water Boards 8 Operationalizing three Regional Water Services Funds 9 Use of block grants for Treasury subventions					
Minister for Works	1 Reorganization of the Water Department Headquarters 2 Establishment of three Regional Water Offices 3 Integration and decentralization of DNSF and Borehole Fund 4 Re-constitution of the Water Resources Board membership 5 Establishment of Secretariat to the Water Resources Board 6 Adoption of new water services tariff policy 7 Implementation of the new operations management system 8 Rehabilitation components of the National Water Development Project 9 Feasibility studies of new area-specific Water Boards 10 Transfer of sanitation responsibility to Regional Water Offices 11 Implementation of the Water Resources and Water Services Act 12 Establishment of Regional Inspectors under Water Resources Board 13 Development components of National Water Development Project 14 Establishment of new feasible area-specific Water Boards					
Other Parties	1 Reorganization of the two City Councils and Water Boards 2 Donor support for National Water Development Project 3 Performance contract between Government and Water Boards 4 Donor support for integrated water services development projects					

Table 4.2 The Demand for New Recruitments to Fill Current Vacancies and Additional Posts in Water Services Institutions, by 1997

Staff Category	Water Dept. and Regional Water Offices	Water Resources Board	Lilongwe and Blantyre Water Boards	Total
1 Executive management	17	4	0	21
2 Middle management and professionals	48	8	10	66
3 Technical and administrative staff	173	18	50	241
Total	238	30	60	328

Incentives are essential mechanisms to attract and retain staff. At least the following improvements in the use of incentives shall be included in the National Water Services Development Plan for the public sector institutions:

- Flexible management and maximum use of the existing incentive provisions;
- Provision of an adequate number of staff houses; and
- Application of performance related professional allowances.

Education, Training and Other Capacity Building

A detailed human resources development programme has been prepared for the following institutions: Water Department, Water Resources Board, Regional Water Offices, Lilongwe and Blantyre Water Boards, and the private sector. It has a total of 45 components. It should be implemented in close cooperation with the Malawi Institute of Management, the Staff Training Centre at Mpemba, and the Ministry of Works' Training Centre at Zomba.

Three additional capacity building instruments are needed to support the Government and its partners in the implementation of the National Water Services Development Plan:

- Policy-oriented studies and consultations on issues of increasing importance;
- Technical assistance, through national and international consultants; and

million) are spread evenly across the six years, whereas most new facilities (MK 35 million) are provided during Phase 1. The cost estimate for technical assistance (MK 19 million) only picks up in 1995, since it is assumed that the proposed National Water Development Project will only start in early 1995.

Table 4.3 Costing of Capacity Building during Phases 1 and 2: 1994-1999

Costs in '000 MK (1993 prices); Exchange rate 1 USD = 4.4 MK

Capacity Building Component	Institution	Phase 1				Phase 2				Total
		94	95	96	Total 94-96	97	98	99	Total 97-99	
HRD and Facilities	Water Department									
	HRD Facilities	130	1,150	470	1,750	1,450	590	480	2,520	4,270
		690	460	460	1,610	340	230	110	680	2,290
	Water Resources Board									
	HRD Facilities	120	200	270	590	40	40	40	120	710
		980	650	650	2,280	490	330	170	990	3,270
	Regional Water Offices									
	HRD Facilities	370	860	600	2,030	750	690	630	2,070	4,100
		8,100	5,400	5,400	18,900	4,050	2,700	1,380	8,130	27,030
	Lilongwe and Blantyre Water Boards									
Private Sector	HRD Facilities	150	520	200	870					870
		1,100	600	600	2,300					2,300
	Training Institutions									
	HRD		180	580	760	620	620	620	1,860	2,620
	Sub-total HRD	770	2,910	2,480	6,160	3,020	1,940	1,770	6,730	12,890
	Sub-Total Facilities	10,870	7,110	7,110	25,090	4,880	3,260	1,660	9,800	34,890
	Other Capacity Building									
	Sector-wide Activities									
	Workshops, studies		180	250	430					430
Technical Assistance	Long-term International Specialists		4,500	5,400	9,900	3,600	900	900	5,400	15,300
	Short-term National Specialists and Consultancies	110	110	110	330	110	110	110	330	660
	Short Term International Specialists and Consultancies	450	450	450	1,350	450	450	450	1,350	2,700
	Sub-total Other Capacity Building	560	5,240	6,210	12,010	4,160	1,460	1,460	7,080	18,090
	Grand Total	12,200	15,260	15,800	43,260	12,060	6,660	4,890	23,810	66,870

4.3 Development Plan for Water Services Delivery 1994-2010

Table 4.4 shows total investments under the National Water Services Development Plan, broken down by the five water services systems and the capacity building costs. Total investments amount to MK 1,900 million over 17 years. If the investments of Lilongwe

- The policy on tariffs and subventions continues to emphasize subventions for those who cannot afford to pay for basic service level water supply at cost price. However, this shall not be interpreted to mean that water can be provided for 'free'. Contributions according to ability to pay must become mandatory. Tariffs for consumers who can pay must be increased to recover part of the fall in the real price of water which has occurred over the last 10 years. This requires an increase in tariffs for urban type piped water supply of 10% p.a. in real terms at least during 1994-1997.

These policies have a profound impact on recurrent costs:

- The need for allocations for recurrent costs is reduced through the choice of appropriate technologies;
- The need for allocations for recurrent costs is reduced through village level operation and maintenance and increased contributions from beneficiaries; **but**
- Actual allocations for recurrent costs are increased to account for depreciation costs.

The recurrent costs of water services delivery nationwide are estimated to amount to a total of MK 3,200 million over 17 years. The annual averages would increase from MK 132 million during Phase 1 to MK 216 million during Phase 3.

Table 4.5 summarizes the results of the analysis by institution. Estimates of investments and revenues by the five different types of water services systems have been split up on Blantyre and Lilongwe Water Boards, the three Regional Water Offices / Boards, and finally the investments in capacity building.

In terms of investment volumes, already funded projects, such as the rehabilitation and extension of the waterborne sewerage system in Lilongwe and major investments by Blantyre and Lilongwe Water Boards, are the most important in Phasse 1. The new investments in Phase 1 focus on institutional development, rehabilitation of current DWSF schemes, and introduction of boreholes / shallow wells with handpumps in urban fringe areas on a pilot basis.

The total foreign exchange costs are estimated at USD 287 million over the Plan period: USD 53 million during Phase 1; 51 million during Phase 2; and 183 million during Phase 3. It would seem logical that at least the foreign exchange costs of the National Water Services Development Plan be met by international donors. To what extent donors wish to contribute also to local and recurrent costs depends primarily on their own aid policies and on their assessment of the economic prospects of Malawi and its Government.

supply. These changes reflect the emphasis on an affordable mix of water services systems.

Table 4.6 Population Coverage Targets by Water Services System by Institution: 2010 (End of Phase 3)

	Population Coverage (Share of total Population)				
	Urban Type Piped Water	Gravity Piped Community Managed	Boreholes / Shallow Wells with Handpump	Waterborne Sewerage	Septic Tank
Blantyre Water Board	65%	0%	35%	13%	17%
Lilongwe Water Board	65%	0%	35%	11%	19%
Regional Water Board - North	20%	18%	43%	0%	6%
Mzuzu Water Board	65%	0%	35%	20%	10%
Regional Water Board - Central	6%	10%	58%	0%	2%
Regional Water Board - South	6%	25%	44%	0%	2%
Zomba Water Board	65%	0%	35%	20%	10%
National target	14%	16%	50%	1%	4%

Based on these planned investments and estimates of revenue from users, projections on the financial performance of sector institutions yield the following results:

Blantyre Water Board is able to survive financially but is very dependent on loan financing. Strictly speaking, it does not require subsidies, but with the level of loans needed, its financial position is weak and Government would most likely have to provide guarantees for the loans. Alternatively, the Government or donors can provide equity or loans on very lenient terms, thus reducing other loan requirements with a similar amount. If the actual tariffs fall short of the recommended ones, the revenues will be lower than projected and the Board will not be able to meet its financial obligations. Adopting the proposed tariff levels also comprises adjusting these in accordance with inflation.

Table 4.7 Summary of Regional Water Offices' Financial Performance

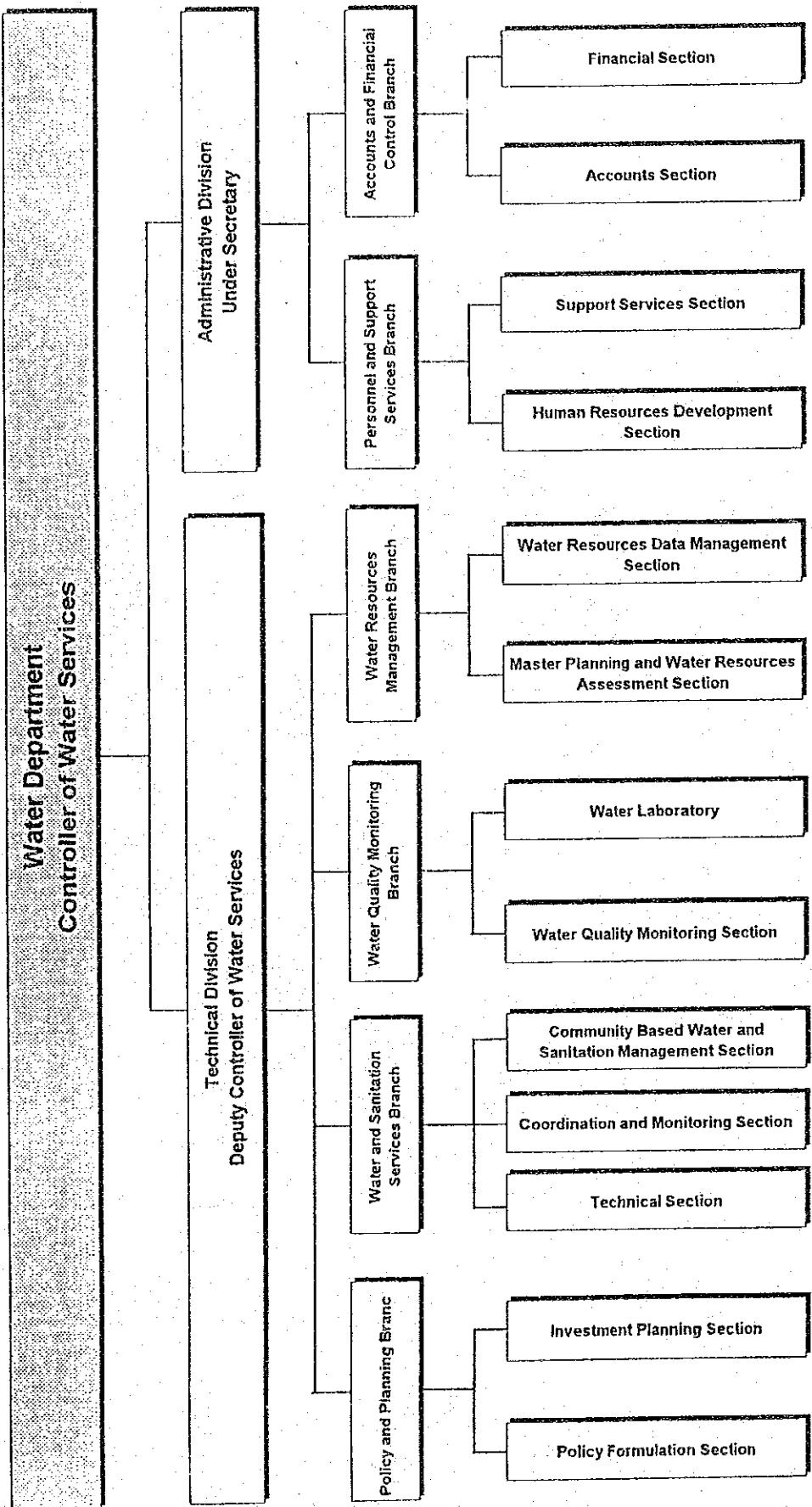
MK million	Annual averages		
	Phase 1	Phase 2	Phase 3
OPERATING PROFIT			
- North	-2.1	0.3	1.4
- Central	-5.4	-2.1	-2.2
- South	-7.0	-2.4	-0.7
- Total	-14.5	-4.2	-1.5
INVESTMENT			
- North	3.9	9.6	8.8
- Central	10.1	34.2	22.3
- South	14.1	39.6	32.5
- Total	28.1	83.4	63.6
- Accumulated investment at end of phase	84.3	334.5	1033.5
EQUITY AT END OF PHASE			
- North	102.4	81.5	-22.0
- Central	105.5	54.8	-258.6
- South	207.2	137.3	-264.8
- Total	415.1	273.6	-545.4
BANK BALANCE AT END OF PHASE			
- North	-3.4	-7.7	-22.0
- Central	-13.4	-36.9	-260.3
- South	-18.7	-47.4	-318.8
- Total	-35.5	-92.0	-601.1
DEBT SERVICE RATIO			
- North	negative	0.2	0.2
- Central	negative	negative	negative
- South	negative	negative	negative
- Total	negative	negative	negative

Notes: - Price level: fixed 1993/94 prices

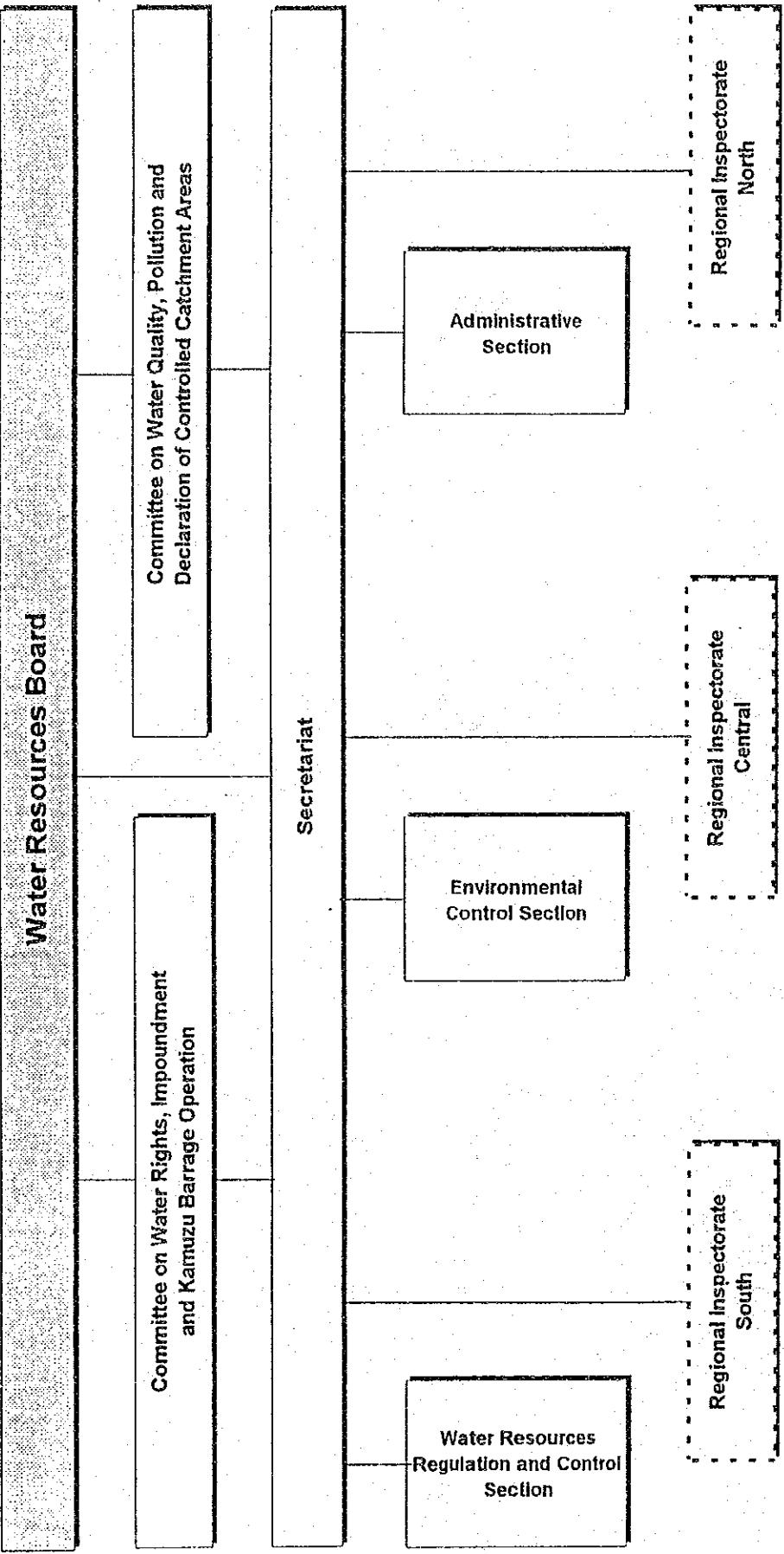
- Debt service ratio = operating profit/(loan repayments + interest)

Appendices

Organization Chart A Future Water Department

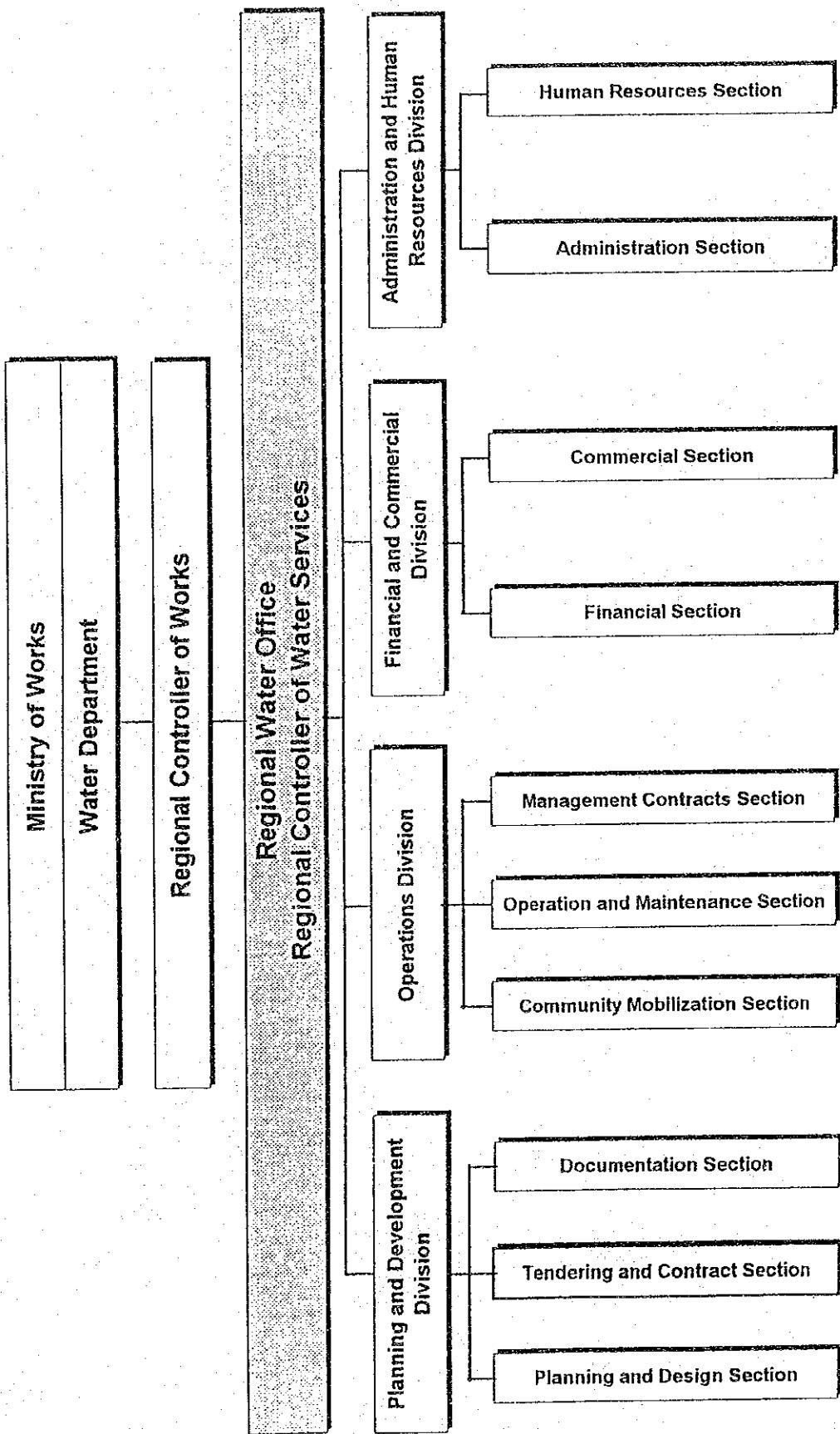


Organization Chart
The Water Resources Board



Legend: Phase 1 Institutions Phase 2 Institutions

Organization Chart A Regional Water Office



2.GROUNDWATER SUPPLY SECTOR

2(3) Waste Water Treatment and Disposal System widely used in Malawi

Groundwater supplies in Malawi are mostly for rural communities with handpumps used to abstract water. Thus no standard waste water disposal from these boreholes is specified though it is a standard practice to drain excess borehole water at well point away from the borehole vicinity to avoid on site pollution. Grouting of boreholes is also practised to avoid waste water pollution a well.

It is assumed much of the borehole supplies qualify in drinking quality, hence no need for pre-treatment before consumption, chemical and bacteriological tests are performed before point installation.

For disposal of human waste Malawians use pit latrines and water closet latrine systems mostly in urban areas. These closet systems may have individual septic tanks or connected to sewage works of the towns and cities and the city municipal councils are responsible. To facilitate the need to encourage sanitation with potable water, Health Education and Sanitation Promotion is jointly undertaken during Community Based Management activities. Ministry of Health and Population extension staff are engaged in promoting this aspect.

2(4) Results of Water Quality Survey

Analysis of chemical elements is the basis for groundwater quality in Malawi. Since 1970's chemical analyses have been undertaken and the archive is useful in providing the widely expected groundwater quality. Water quality laboratory facilities were constructed in 1982-83 for more accurate analyses.

On a national scale, groundwater quality is widely acceptable for rural water supplies. Minor problem areas do exist where the water quality is not fit for consumption. Areas with poor groundwater quality can usually be delineated by geophysical methods and electrical conductivity (EC) of higher than 3000 US/cm World Health Organization standards appear too stringent for Malawi where alternative source may likely be polluted. A guiding standard for Malawi is as below:

	GOOD	FAIR	MODERATE	POOR
Electrical Conductivity (US/Cm)	0-750	750-1500	1500-3000	>3000
Na(mg/l)	0-115	115-230	230-460	>460
Mg(mg/l)	0-30	30-60	60-120	>120
Hardness(as Mg CaCO ₃ /l)	0-250	250-500	500-1000	>1000
CL(mg/l)	0-180	180-360	360-710	>710
SO ₄ (mg/l)	0-145	145-290	290-580	>580

Groundwater quality in weathered basement aquifer; From existing data, it suggests that mineralization of groundwater is low due to leaching of the weathered zone of its soluble minerals. Groundwater is mostly from recent recharge. Electric conductivity(EC) which may relate to dissolved solids is mostly low(1500 US/cm) - 750 US/cm). Few areas of Malawi show EC of over 3000 US/cm. Areas towards rift valley as the Lower Shire Valley show high EC. Drastic changes and variable groundwater quality are sometimes observed and may be evidence of low permeability, slow groundwater movement and minimal water mixing.

Groundwater quality layering is available in this type of aquifer. The PH in this aquifer type is usually between 5.5 to 7.

Groundwater quality in alluvial aquifer is heterogenous within short distances. Enhanced mineralization and mineralization in fault zones and varying nature of sediments allow for processes to occur. EC may reach 1000 US/Cm. Extreme EC of over 2000 US/Cm - 17000 US/Cm usually have sulphate or Chloride ion implication. Dissolution from gypsum(CaSO₄) or common salt(Na CL) and sulphates as pyrite(Fe2S). Evaporation in shallow water environments may also form salty as in Lake Chilwa Basin and parts of the Lower Shire Valley. Generally along the lakeshore region of Malawi, there is a tendency for water quality to become less mineralised towards the lake, and may reflect recharge to alluvium from rainfall and rivers.

Highly mineralised groundwater is also thought to be associated with hydrothermal activities and up flow of thermal water along faults. Much evidence has been obtained from numerous hot springs along the lake region.

Groundwater quality in the Karro aquifers is variable - fresh water to highly saline waters mostly the calcareous and evaporite minerals dominate the process, with dissolution

causing saline groundwater. Individual ion problems occur and are local as of iron, manganese, chloride, fluoride and nitrate. Less than 5mg/l of nitrate indicates little groundwater pollution in Malawi. Concentrated village patterns are likely to have nitrate levels.

Bacteriological tests are undertaken for analyses on faecal coliforms which indicate presence of pathogens. Well siting, construction design and good well completion practices are adhered to avoid this. Each well site is treated independent of another and in due consideration of the surroundings.

2(6) Siting Methods, Description of Survey Equipment

Various methods for borehole siting have been used in Malawi since 1930's when the Department of Geological survey was responsible for groundwater development. The methods then mostly were for mineral exploration with little consideration for hydrogeology.

It is now customary to undertake geophysical surveys on all intended well sites and that the resistivity surveys are widely used. The Abem SAS Terrameter and Japanese OHM metres are used with the Wenner and Schlomberger arrays used. Usually qualitative interpretation is done on site by siting hydrogeologist. One piece of Abem VLF equipment is available and used.

3. Operation and Maintenance System

3(7) There are maintenance units based at the district headquarters.

No. of staff : 2 TO/STA/TA

6 CREW MEMBERS

1 DRIVER

Activities : Conducting CBM trainings, monitoring and evaluation.

Existing Equipment : Motor vehicles for major repairs and motor cycles for trainings and minor repairs.

4. Rural Water Management Committee

(1) Organization Chart

Chairman, Vice Chairman

Secretary, Vice Secretary

Treasure, Vice Treasure and

4 Committee Members

- (2)** The committee is composed of ten people of which 70% is recommended to be women.

- Three of the ten people are trained on maintenance of the hand pump and are termed mechanics. Two of the three are recommended to be women.

- (3)** A study has not been conducted to assess the budget, revenue and expenditure however it has been observed that a maintenance kit(kit for fast wearing parts) would be required for the whole year on average if there are no installation problems and quality control of the spares is being maintained. The kit costs K138.00. Amount raised depends means of income in a particular area, and also season of the year.

- (4)** The following are activities of the Rural Water Management Committee:

(i) Carrying out preventive maintenance on the water point.

(ii) Educating users on proper operation of the pump.

(iii) Fund raising and purchasing of spares.

- (5)** Currently the Government procures Afridev pump spare parts from local and foreign manufacturers and makes them available for purchasing by communities through Chipiku shops.

- (6)** Since all major repairs are done by centralised maintenance teams delays to have major breakdowns repaired are experienced and communities have been requesting to be trained on repairs of major breakdowns AS WELL.

- Affordability for some parts which are expensive.
- Availability of some of the spares.

5. Project Sites

5(1) General description of Mzimba District

Mzimba is the largest district in Malawi and occupies an area of 10,430Km². Two topographic zones are present in the district. The Eastern zone is dominated by the Viphya mountains and is relatively high in altitude, and extends from the northern to the southern boundary of the district, with topographic height/altitude ranging from 1500 to 2,000 metres above sea level.

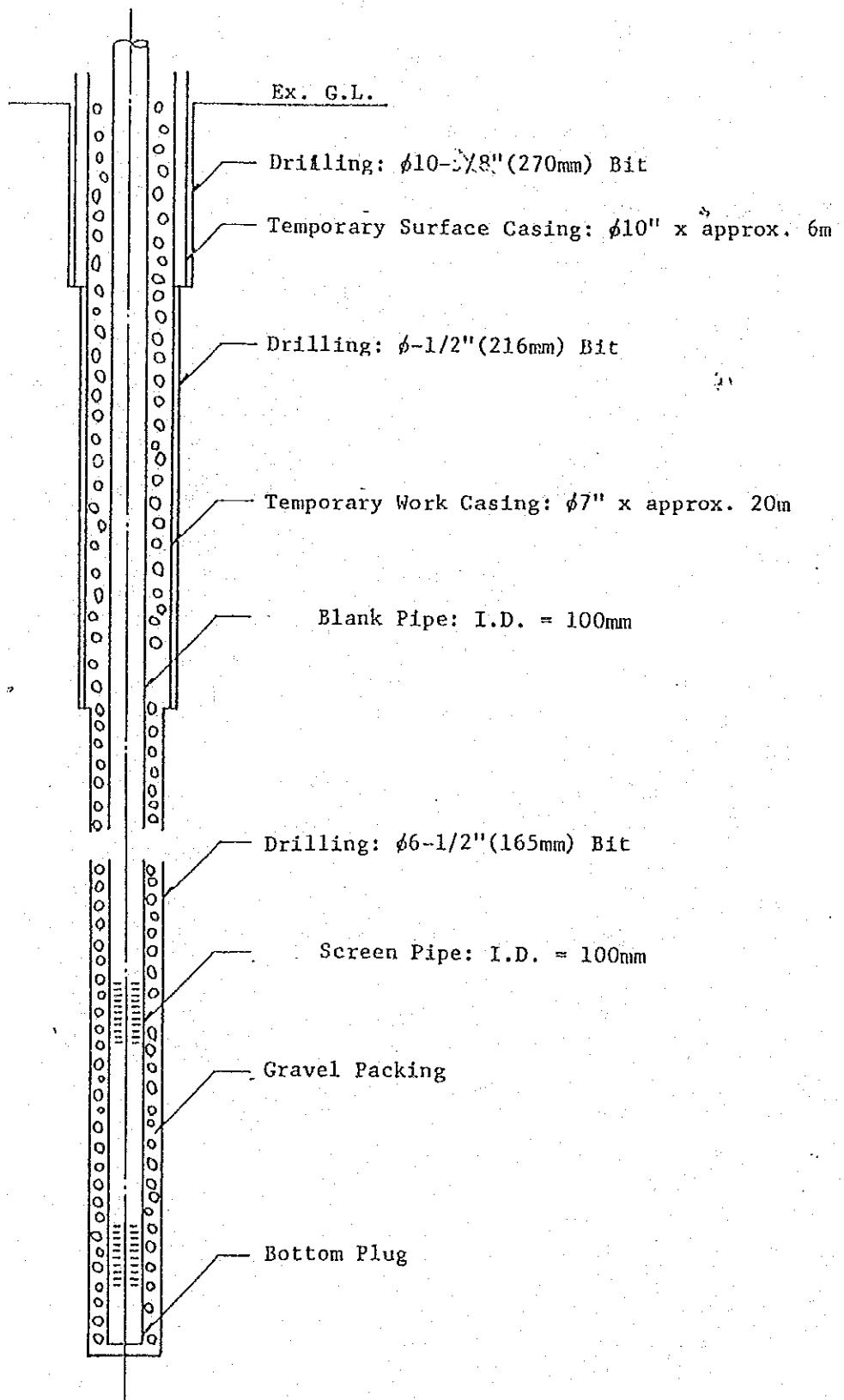
The western zone is low lying(1,000-1,500m above sea level) with scattered small hills. This zone is highly populated compared to the other. Subsistence farming is the main agricultural activity. Cattle rearing is also practised in the area.

Water sources are however limited in the area for both agriculture and domestic consumption. Water quality is usually bad for surface water supplies and hand dug open shallow wells. Most streams are not perennial in Mzimba West area, and communities dig into dry river beds to obtain water in dry season. Thus, due to non availability of perennial streams and hilly topography, this part of Mzimba can only be covered with borehole supplies.

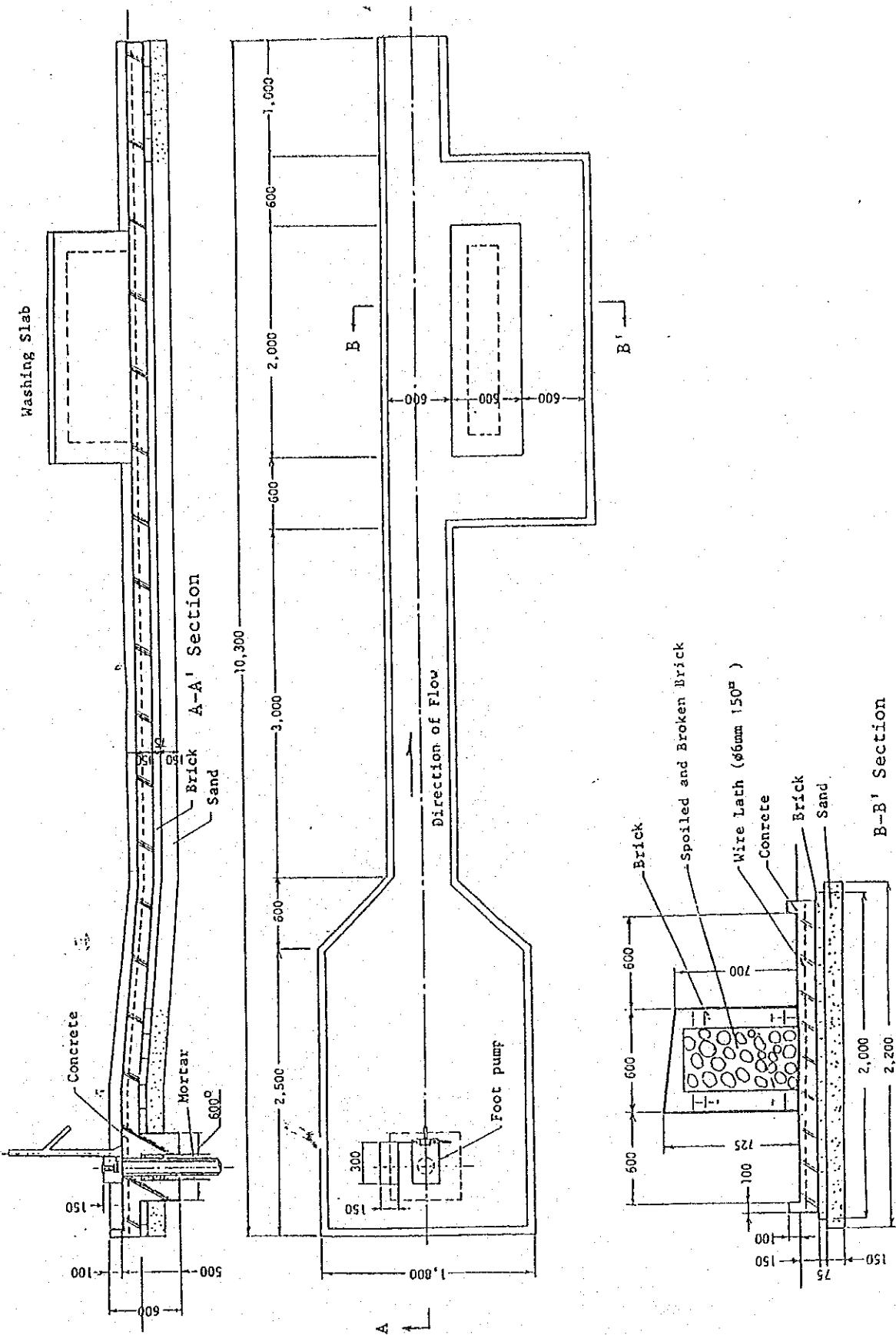
6. OTHER

6. (6)

Structure of Borehole



Plan and Section of Auxiliary Facilities



6.7 DETAIL DESIGN OF THE AFRIDEV HANDPUMP

The AFRIDEV started life in Malawi in early 1981. From the start, the aim was to produce a deep well handpump that was very easy to maintain at village level and could be manufactured in countries like Malawi, where industrial resources are limited. The MALDEV pumphead went into production in early 1982, and was a significant step forward in pumphead design, with the users' needs given first priority.

Early in the field testing of MALDEV pumps, the ball bearings caused problems and the first AFRIDEV pumphead, which uses plastic bearings, was installed in Malawi in late 1982. Major efforts to resolve the "bearing problem" continued up to early 1985, when a plastic bearing design was finalised.

The focus of AFRIDEV development shifted to Kenya in early 1983, although testing continued in Malawi and important contributions were being made by field workers in several East African countries, as well as by experts from organizations in Europe, who provided specialist advice or laboratory testing facilities. International handpump design meetings were held in Kenya in late 1984 and early 1986, and throughout this period design and testing of pumpheads, cylinders, rods and rising mains continued. At all times, the primary objectives were absolute simplicity of maintenance, and minimum quality control requirements to simplify manufacture.

Plastics research and development has played a vital role in the success of this project, of which the outcome is the AFRIDEV pump system.

The Afridev pump has an international standard specifications published by the Swiss Centre for Development Corporation in Technology and Management (SKAT) based in Switzerland. This standard specifications are used world wide by manufacturers in producing the pump. The Malawi Bureau of Standards has adopted the SKAT specifications for the Afridev pump as a local standard and have now developed a quality assurance scheme to monitor the quality of locally manufactured pumps and spareparts and also to check the quality of imported pumps.

The Afridev handpump is now in mass production and is demonstrating that deep well handpumps can be maintained by village men and women, can be manufactured in most developing countries and can still be affordable and reliable.

7. Maps and Information

- 7(2) Only one Geological Map of Malawi and one sheet of Map for Mzimba area have been made available by the Geological Survey Department. The others will be supplied soon from Zomba office.
- 7(4) There are no aerial photos available at the Department of Surveys at the moment, the photos are made on request.

= 325 photos

Cost = 325 x K131.25 = K42,656.25

7(12) Role of NGOs in Items of Maintenance of Water Supply

ROLE OF NGOS' IN MAINTENANCE OF WATER SUPPLY FACILITIES

Major emphasis placed only on hardware aspects of rural water supply programmes in the past led to the rapid deterioration of many schemes. The past experiences and lessons learned in Malawi clearly points to the urgent need to improve assistance and support to communities in order for them to take on the management of maintenance of their water and sanitation facilities.

In order to establish the present approach of Community Based Management of Maintenance of rural water supplies in Malawi the following three major courses of action are required:

- promote approaches to community based management of maintenance of rural water supplies
- promote effective environmental sanitation and hygiene strategies which are well integrated with water supply interventions
- strengthen district level capacities to support communities in their water and environmental sanitation activities

In order to achieve effective national level co-ordination the above activities outlined are being facilitated by the Community Based Management Unit (CBMU) in the Ministry of Irrigation and Water Development. The NGOs' activities geared towards community based maintenance are coordinated by the CBMU. The co-ordination between the Ministry and NGOs is done mainly through two forums:

- National Steering Committee for Village Level Operation and Maintenance of rural water supplies
- NGOs forum for rural water supplies

The role currently being undertaken by NGOs towards Community Based Maintenance

- Assisting the Government in training of Water Committees in maintenance of the water source and equipments, hygiene education and sanitation
- Assisting the Government in procuring equipment for training (transport and other) and spareparts required for maintenance
- Assist the Government in strengthening National, Regional and District level activities geared towards community based maintenance by way of secondment of their own staff to various Ministries involved in the water sector.

Table 1 Rural Water Supply Projects(1985~) by the Government of Malawi

No.	Period	Name of Project	Site	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)	* Benefit
1	1987-1992	Mpira Balaka Gravity Fed Project	Machinga Ntcheu	ADP and DANIDA	12.65 Million EUA	Water supply (piped)	(1)(2)(3)
2	-1994	Ruarwe Water Project	Nkhatabay	USAID	"	"	"
3		Usisya Water Project	"	"	"	"	"
4		Sekwa Water Project	Chitipa	"	"	"	"
5		Chikwawa East Bank Water Project	Chikwawa	"	"	"	"
6	-1986	Msaka	Mzimba	"	"	"	"
7	-1987	Lifutazi	"	"	"	"	"
8	-1985	Marala	Machinga	"	"	"	"
9	-1985	Makwawa	Zomba	"	"	"	"
10	-1986	Mwanza Valley	Mwanza	"	"	"	"

* Write down the following number(s) of benefit to local people :

- ① Reduction of work of drawing water
- ② Productive use of time
- ③ Decrease of water-related diseases
- ④ Increase of food production
- ⑤ Increase of livestock

Table 1 Rural Water Supply Projects(1985~) by the Government of Malawi

No.	Period	Name of Project	Site	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)	* Benefit
9	-1987	Champhira South	Mzimba	USAID	"	Piped Water	1,2,3
10	-1986	Zomba West	Zomba	"	"	Rural piped	"
11	-1986	Msaka	"	"	"	"	"
12	-1987	Lifutazzi	"	"	"	"	"
13	-1987	Mwanzambo	Nkhotakota	"	"	"	"
14	-1989	Mulanje South	Mulanje	"	"	"	"
15	-1991	Chipoka	Salima	World Vision International	"	"	"
16	-1992	Mpira/Balaka	Ntchewu	ADB/DANIDA	Piped water supply	"	"
17	-1986	Chisenga	Chitipa	USAID	Rural piped Water Supply	"	"
18	(1996) On going	Chinthekwa	Nkhata Bay	Africare	"	"	"
19	On going	Rhimba	"	Africare/ USAID	"	"	"

* Write down the following number(s) of benefit to local people :

- ① Reduction of work of drawing water
- ② Productive use of time
- ③ Decrease of water-related diseases
- ④ Increase of food production
- ⑤ Increase of livestock

Table 1 Rural Water Supply Projects(1985~) by the Government of Malawi

No.	Period	Name of Project	Site	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)	* Benefit
20	1996 On-going	Iluwawa	Mzimba	Africare/USAID	"	Rural piped water supply	1,2,3
21	On-going 1996	Whunju	Rumphi	W.V.I.	"	"	"
22	On-going 1996	Sankhulani	"	"	"	"	"
23	On-going 1996	Ntchena-Chena	Rumphi	"	"	"	"
24	On-going 1996	Ngozi	"	"	"	"	"

* Write down the following number(s) of benefit to local people :

- ① Reduction of work of drawing water
- ② Productive use of time
- ③ Decrease of water-related diseases
- ④ Increase of food production
- ⑤ Increase of livestock

Table 3 Groundwater Development Project(1985~) by other Governments, Ministries, Agencies

No.	Period	Name of Project	Site	Responsible Ministry	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)
1	1986 - 91	KARONGA LAKE SHORE INTEGRATED GROUND-WATER PROJECT	KARONGA LAKESHORE	MINISTRY OF IRRIGATION & WATER DEVELOPMENT	DANIDA GRANT	565,000	PROJECT DESCRIPTION (FACILITIES, EQUIPMENT TRAINING)
2.	1986 - 89	EMCISWENI	MZIMBA	MINISTRY OF IRRIGATION & WATER DEVELOPMENT	UNICEF GRANT	286,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
3.	1987 - 88	DEDZA HILLS	DEDZA	MINISTRY OF AGRICULTURE	IDA LOAM	650,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
4.	1989 - 90	NORTH KAWINGA PROJECT	MACHINGA	MINISTRY OF IRRIGATION & WATER DEVELOPMENT	JAPAN GRANT	¥988 Mil.	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
5.	1992 - 94	KALEMBO GROUND-WATER PROJECT	MACHINGA	MINISTRY OF IRRIGATION & WATER DEVELOP.	KFW GRANT	4,000,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES

Table 3 Groundwater Development Project(1985~) by other Governments, Ministries, Agencies

No.	Period	Name of Project	Site	Responsible Ministry	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)
6.	1987 - 90	KASUNGU/MCHINJI/ DOWA EAST PROJECT	KASUNGU MCHINJI DOWA	MINISTRY OF AGRICULTURE	IFAD LOAN	820,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
7.	1987 - 90	SALIMA BWANJE PROJECT	SALIMA/ BWANJE	MINISTRY OF IRRIGATION & WATER DEVELOPMENT	EEC LOAN	160,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
8.	1991 - 92	SALIMA/NKHOTA-KOTA	SALIMA NKHOTA-KOTA	MINISTRY OF IRRIGATION & WATER DEVELOPMENT	EEC LOAN	2,500,000	PROVISION OF PORTABLE WATER TO THE COMMUNITIES
9.	BEING REQUESTED	ZOMBA WEST	-	-	-	-	-

Table 3 Groundwater Development Project(1985~) by other Governments, Ministries, Agencies

No.	Period	Name of Project	Site	Responsible Ministry	Name of Donor	Grant / Loan (Amount)	Project Description (Facilities, Equipment, Training)
10	1991-1992	Nsanje/ Dowa/Kasungu Mchinji	Nsanje Dowa Kasungu Mchinji	Min. of Agriculture	UNICEF IPAF Loan	900,000	Provision of portable water to the communities.
11	1989-1992	Namwera/Mango-chi	Mangochi	Min. of Irrigation and Water Development	KfW grant	2,260,000	Provision of portable water to the communities.
12	1991-1992	Northern and Central Regions		Min. of Irrigation and Water Development	IDA Loan	4.4 mil US\$	Provision of portable water to the communities.
13	1991-1992 Work will commence soon			Min. of Irrigation and Water Development	UNCDF/UNDP grant	5.2 mil US\$	
14	1992-1994 being requested	Southern Region					
15							

Table 4. Information procured by Japanese Government for Water Supply and Groundwater Development Project

NO.	Equipment	Manufacture (Model / Origin)	Technical Specification	Quantity	Year(s) Used	Purchase/ Grant	Current condition/ Repair done
1	Drilling Rig	Koken FSW 7T - S22 (Japan)	Water cooled diesel engine RH drive 4 x 4 Drilling capacity 100m	2	1987	Kawinga G/W Project	Both in Workshop for repairs
	Drilling Rig	Koken FSW 7T - S22 (Japan)	Water cooled diesel engine RH drive 4 x 4 Drilling capacity 100m	1	1992	Mchinji G/W Project	In good condition
2	Test Pumping Equipment	DWT - 60C PD5125 DCA - 27P1	Water cooled diesel engine RH drive Compressor: 7Kg/cm ² x 3.5m ³ /Min Generator: 50Hz 220V, 20Kva	2	1987	Kawinga G/W Project	Not in good condition
	Test Pumping Equipment	DWT - 60C PD5125 DCA - 27P1	Water cooled diesel engine RH drive Compressor: 7Kg/cm ² x 3.5m ³ /Min Generator: 50Hz 220V, 20Kva	1	1992	Mchinji G/W Project	In good condition
3	Electric Logging Equipment	Automatic recording with 100m long cord	Natural Electric potential Resistivity (Micro, with log)	2	1987	Kawinga G/W Project	In good condition
	Electric Logging Equipment	Automatic recording with 100m long cord	Natural Electric potential Resistivity (Micro, with log)	1	1992	Mchinji G/W Project	In good condition
4	Transportation Equipment						
	4WD Station Wagon	Toyota		2	1987	N. Kawinga G/W	Out of service

4WD Pickup	Toyota		2	N. Kawinga G/W	Out of service
4WD Station Wagon	Toyota		2	1992 Mchinji G/W	In out of service
4WD Pickup	Toyota		2	1987 N. Kawinga G/W	Out of service
8 tone Cargo	Hino		2	1987 N. Kawinga G/W	Out of service
8 tone Cargo	Hino		2	1992 Mchinji G/W	In use
4 CU. m Water Tank lorry	Hino		1	1987 N. Kawinga G/W	In use
4 CU. m Water Tank lorry	Hino		1	1992 Mchinji G/W	In use
Motorcycle	Honda	125cc	4	1987 N. Kawinga G/W	Out of order
5 Communication Equipment			1 se	1987 Kawinga G/W	Out of order due to frequency difference
Communication Equipment			1 se	1992 Mchinji G/W	In use

Table 8. Information of Local Drilling Contractors

Name of Drilling Contractor	Telephone and Fax	Name of Equipment, Materials, Vehicles or Machinery they deal with	Response to After Care and Your Evaluation on their work
Water Boring Contractors	Telfax: 765267	11 Cable Tool Rigs 6 Tractors (4 x 4) 8 Trucks 2 Vehicles	The oldest drilling company in Malawi with clean record of operation
Scandrill Ltd	Tel: 722391 Fax: 723896		The biggest drilling contractor with air drilling equipment Has executed big projects in the country
Drill Tech Engineering Ltd	Tel : 645323 : 642691 Fax : 672014	2 Air Rigs 2 Compressors 2 Tractors 2 PumpTests 1 x 7 tone Truck 7 x 1 tone Truck	Fairly New Company has done work for Non Governmental Organisation
Contact Drillers	Tel : 643352 : 640439 Fax : 640545	2 Cable Tool Rigs (Indian Make) 7 Air Rigs 5 x 7 ton trucks 1 x 2 ton trucks 7 x 1 ton trucks	Different types of drilling machines frequent breakdowns Delays progress of thin work
Water Drilling Contractors	821399		Fairly New Company, less than a year old

Table 9 Information of Local Survey Consultants on Groundwater

Name of Survey Consultant on Groundwater	Address	Telephone and Fax	Name of Equipment, Materials, Vehicles or machinery They deal with	Response to After Care and Your Evaluation on Their Work
			N O N E	

Table 11 List of Construction Material Prices

Material	Specification	Unit	Price (Mts)
Cement	Portland Cement	kg	K100/50kg
Fine Aggregate	River Sand, $\phi 0.1 \sim 0.5$ mm	m ³	180/m ³
Coarse Aggregate	River Gravel, $\phi 5 \sim 40$ mm	m ³	350/m ³
Reinforcing Bar/Steel	$\phi 9$ mm	ton	115.85/m
Form for Concrete	Wooden Form	m ²	55/m ²
Gravel for Well		m ³	
Packing	$\phi 3 \sim 9$ mm	m ³	200/m ³
Diesel Oil		l	8.40/l
Gasoline		l	10.00/l
Handpump	Steel handpump for Deep Well including Waterpipe 40 m	set	
Handpump	Stainless/Brass handpump for Deep Well including Waterpipe 40 m	set	K6000.00
Casing Pipe	PVC, describe specific size 110mm ϕ Class 16	piece	154/08/m
Casing Pipe	FRP, describe specific size	piece	
Casing Pipe	Steel, describe specific size	piece	
Screen Pipe	PVC, describe specific size 110mm ϕ Class 16	piece	169.64/m
Screen Pipe	FRP, describe specific size	piece	
Screen Pipe	Steel, describe specific size	piece	
Centralizer	Steel, describe specific size	piece	
Centralizer	Steel, describe specific size	piece	
Bottom Plug	Steel, describe specific size	piece	
Bottom Plug	Steel, describe specific size	piece	
Bottom Plug	PVC, describe specific size 110mm	piece	94.60/each
Bentonite	Class-A	ton	

Table 12 Information of Local Agents/Suppliers of Major Manufacturers
for Water Supply Facilities, Machinery and Supporting Equipment/Vehicles

Name of the Agent	Address	Telephone and Fax	Name of Manufacturer and Country of Origin with whom	Name of Equipment, Materials, Vehicles, or machinery They deal with	Response to After Care/Spare Parts Supply and Your Evaluation
TOYOTA MALA- WI	P.O. BOX 360, LILONGWE	721 566 FAX 721 917	TOYOTA JAPAN	TOYOTA TRUCKS TOYOTA DOUBLE CABS TOYOTA STATION WAGON	SERVICE AND SUPPLY OF SPARE PARTS

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

7(13) DETAILS OF HANDPUMP REHABILITATION PROJECT BY W.B
IN THE PROJECT AREA.

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE mm	DEPTH TYPE OF BH m.b.s	WATER LEVEL m.b.s	SPEC CAP. l/sec/m	MAX YIELD CAP. l/sec/m	PUMP TYPE	BACT PROB	CHEM PROB
151 Nor KA	Chankholombe	1034A3	263402	PP88	1993	110 PVC	40.1	12.6	0.19	1.33	24 AFDEV	
152 Nor KA	Mulare D\T	0933D4	923137	PP92	1993	110 PVC	50.2	Abandoned due to low yield	0.87	18	AFDEV *	*
153 Nor KA	Mwenentanga	0933D4	947072	Q383	1993	110 PVC	5.6	0.08	0.87	18	AFDEV *	*
154 Nor KA	Mwakwama I	0933D4	947047	Q384	1993	110 PVC	40.1	3.7	2.76	1.66	24 AFDEV	
155 Nor KA	Ngerenge Dip Ta	0933D4	897158	Q455	1993	110 PVC	50.3	5.4	0.02	1.11	39 CLIMAX*	*
156 Nor KA	Kiwe Custom	0933D4	959206	R206	1993	110 PVC	43.5	3.1	0.03	1.11	33 AFDEV *	*
157 Nor KA	IGhembe	0933D2	953236	SM62	1993	110 PVC	45.6	10.1	0.07	0.91	30 AFDEV *	*
158 Nor MZ	Kafukule Police	1133B3	690337	A180	1993	110 PVC	41.6	4.6	0.02	0.59	27 AFDEV *	*
159 Nor MZ	Kazapi Mtonga	1133B3	559474	A185	1993	110 (PVC)	30.3	12.5	0.08	1.10	27 AFDEV *	*
160 Nor MZ	Mtwalo Court	1133B3	815407	A186	1993	110 PVC	52.8	21.9	0.04	1.11	33 AFDEV *	*
161 Nor MZ	Chibandauka	1233D1	705016	A187	1992	110 PVC	84.3	10.2	0.002	0.14	33 AFDEV *	*
162 Nor MZ	Jonas Lowele	1133D3	557912	A21	1993	110 PVC	31.2	5.6	0.01	0.25	24 AFDEV *	*
163 Nor MZ	Mtenthe school	1133D3	565892	A23	1992	110 PVC	54.9	2.5	0.02	0.25	33 AFDEV *	*
164 Nor MZ	Mhiafula Sch.	1233A4	458387	A367	1993	110 Steel	20.0	8.2	0.70	1.18	15 AFDEV *	*
165 Nor MZ	Mpherapi Vge.	1133B1	735606	A85	1994	110 (PVC)	48.5	15.9	0.04	0.71	33 AFDEV *	*
166 Nor MZ	Elunyeni Sch.	1133B1	713664	A86	1993	110 (PVC)	48.5	15.9	0.04	0.71	33 AFDEV *	*
167 Nor MZ	Mpherapi Vge.	1133B1	727603	A87	1994	110 PVC	63.0	6.0	0.06	1.33	33 AFDEV *	*
168 Nor MZ	Mbalachanda	CC12	1994									
169 Nor MZ	Muyenga Vge.	1133B2	865659	CC153	1994	110 PVC	46.2	10.2	0.01	0.34	39 AFDEV *	*
170 Nor MZ	Emusizini Disp	1133B4	903352	CC154	1993	110 PVC	49.6	7.5	0.09	1.30	21 AFDEV *	*
171 Nor MZ	Enyezeni	1133B4	945331	CC156	1993	110 PVC	33.0	1.0	0.05	0.87	15 AFDEV *	*
172 Nor MZ	Chankhangwa	1133B2	865577	CC162	1993	110 PVC	46.5	3.6	0.10	1.25	21 AFDEV *	*
173 Nor MZ	Envuyeni Sch	1133B4	902433	CC163	1993	110 PVC	40.5	6.8	0.08	0.90	21 AFDEV *	*
174 Nor MZ	Kavisopo	1133A4	494384	CC169	1993	110 PVC	38.3	3.6	0.03	0.71	33 AFDEV *	*
175 Nor MZ	Nthumba School	1434B4	32199	CC172	1993	110 PVC	32.9	3.4	0.07	1.00	21 AFDEV *	*
176 Nor MZ	Thundukwe School	1133B1	614655	CC21	1993	110 PVC	46.9	21.8	0.10	1.00	27 AFDEV *	*
177 Nor MZ	Jandalala Sch	1133C2	412072	CG41A	1993	110 (PVC)	35.4	5.0	0.01	0.21	27 AFDEV *	*
178 Nor MZ	Ruwwere Dispensary	1133B3	734413	DP44	1993	110 PVC	57.5	22.5	0.03	0.59	33 AFDEV *	*
179 Nor MZ	Bwengu Dispensa	1133B2	999760	DP45	1993	110 PVC	33.3	5.7	0.15	1.11	24 AFDEV *	*
180 Nor MZ	Kavula School	1133B3	9639	DP46	1993	110 PVC	55.8	14.5	0.10	2.00	27 AFDEV *	*

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST	LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE	CAS. TYPE OF BH	DEPTH	WATER LEVEL	SPEC CAP.	MAX YIELD 1/sec/m	PUMP CAP. 1/sec	PUM. 1/sec	BACT PROB.	CHEM PROB.	
181 Nor MZ	Mzalangwe D/Tan1133D1	621153	DP48	1993	110 PVC	51.0	21.5	0.02	0.42	33	AFDEV					
182 Nor MZ	Muwange Vge.	1133B2	917593	DP49	1994	110 PVC	61.9	17.5	0.04	0.69	39	AFDEV				
183 Nor MZ	Kamatawo Sch.	1233B3	578416	DP53	1992	110 PVC	43.5	8.2	0.03	0.65	27	AFDEV	*	*	Fe	
184 Nor MZ	Kanyika School	1233D1	713955	DP54	1992	110 PVC	31.8	13.1	0.02	0.25	24	AFDEV			Fe	
185 Nor MZ	Foster Jere	1233A2	501585	DP58	1993	110 PVC	38.7	8.4	0.03	0.65	21	AFDEV	FC	FS		
186 Nor MZ	Bulala School	1133C2	485095	E100	1994	100 Steel	32.5	22.6	0.04	0.28	30	AFDEV				
187 Nor MZ	Mzalangwe MCDE	E101	1994	100 Steel	1993	110 PVC	26.5	8.5	0.02	0.26	27	AFDEV				
188 Nor MZ	Yakuwata	1133A4	469431	E138	1993	110 PVC	23.8	7.3	0.03	0.40	15	AFDEV				
189 Nor MZ	Kajembe Kumwendu	1133A4	516327	E139	1993	110 PVC	23.8	7.3	0.03	0.40	15	AFDEV				
190 Nor MZ	Engucwini	1133B3	900627	E187	1993	110 PVC	22.0	2.1	0.02	0.37	18	AFDEV	*	*		
191 Nor MZ	Madise School	1133B4	849553	E188	1993	110 PVC	60.7	15.8	0.01	0.25	33	AFDEV	*	FS	*	
192 Nor MZ	Champhira T.C	1233B3	657367	E292	1992	110 PVC	44.3	11.7	0.05	0.90	33	AFDEV	*	*		
193 Nor MZ	Levi Jere	1233B3	609322	E293	1992	110 PVC	35.5	4.5	0.02	0.65	30	AFDEV				
194 Nor MZ	Mjinge Sch.	1133C4	395808	E89	1992	110 PVC	30.9	6.5	0.01	0.15	24	AFDEV	FC	*		
195 Nor MZ	Mabiri School	1233A2	468465	E94	1992	110 PVC	16.0	3.0	0.08	0.77	9	AFDEV	*	*		
196 Nor MZ	Emchakachenii	1233B1	579577	E95	1992	110 PVC	29.5	19.0	0.05	0.36	27	AFDEV	*	*		
197 Nor MZ	Manyamula	1133C4	479809	E97	1992	110 PVC	42.1	5.4	0.01	0.22	30	AFDEV				
198 Nor MZ	Jandalala	1133D1	684181	E99	1993	110 PVC	36.8	7.2	0.04	0.71	27	AFDEV				
199 Nor MZ	Mphimbu School	1133B3	684375	EM13	1993	110 PVC	45.3	2.7	0.08	1.25	24	AFDEV				
200 Nor MZ	Nzimewa Jere	1133B3	664434	EM17	1993	110 (PVC)	37.5	14.2	0.02	0.41	33	AFDEV	*	*		
201 Nor MZ	Chimunyama	1133A4	479465	EM24	1993	110 (PVC)	45.3	14.5	0.08	0.59	21	AFDEV	*	*		
202 Nor MZ	Diere Vge.	1133B1	646658	EM27	1993	110 PVC	5.8	0.9	0.80	0.80	39	AFDEV				
203 Nor MZ	Kazuni Admarc	1133B1	709668	EM30	1993	110 PVC	47.9	14.5	0.08	0.44	24	AFDEV				
204 Nor MZ	Nemon Mlotha	1133B3	665418	EM8	1993	110 PVC	45.3	5.8	0.09	0.87	39	AFDEV				
205 Nor MZ	Mijuma Nyasulu	1133B1	774676	EMB10	1994	110 (PVC)	31.4	11.9	0.18	1.00	24	AFDEV				
206 Nor MZ	Jenda Mlotha	1133B3	661415	EMB12	1994	110 (PVC)	38.5	9.5	0.03	0.44	24	AFDEV				
207 Nor MZ	Lufukazi	1133B3	641552	EMB16	1994	110 (PVC)	60.0	15.3	0.05	0.87	39	AFDEV				
208 Nor MZ	Enaya Kumwendu	1133B1	708670	EMB18	1994	110 (PVC)	22.5	1.1	0.04	0.74	18	AFDEV				
209 Nor MZ	Chibula Mdlopwa	1133B3	653471	EMB21	1994	110 (PVC)	35.3	13.2	0.03	0.54	30	AFDEV	*	*		
210 Nor MZ	Matchumitere	1133B3	666530	EMB25	1994	110 (PVC)										

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH.	CAS. SIZE.	DEPTH OF BH LEVEL	SPEC CAP. m.b.s	MAX PUMP CAP. 1/sec/m	PUM. DEPTH 1/sec	BACT. TYPE	CHEM PROB.
211 Nor MZ Limeyo Jere	1133B3	654556 EMB35	1993	110 (PVC)	15.8	8.2	0.09	0.35	12	AFDEV *	*
212 Nor MZ Alifeyo Mjuma	1133B1	769652 EMB39	1994	110 PVC	52.2	3.4	0.02	0.57	39	AFDEV	
213 Nor MZ Yagontha Muthali 1133B1	711673 EMB4	1994	110 (PVC)	19.4	8.9	0.19	1.00	15	AFDEV		
214 Nor MZ Yatotta Muthali 1133B1	711673 EMB4	1994	110 (PVC)	19.4	8.9	0.19	1.00	15	AFDEV		
215 Nor MZ Khuyu Village	1133B1	778675 EMB40	1994	110 PVC	57.7	27.8	0.05	0.48	39	AFDEV	
216 Nor MZ Chigona Ny.	1133B1	580655 EMB41	1994	110 (PVC)	30.5	13.4	0.01	0.20	27	AFDEV	
217 Nor MZ Lameke Chisi	1133B1	594657 EMB42	1994	110 (PVC)	45.7	2.0	0.15	1.43		AFDEV	
218 Nor MZ Embombeni R/C	1133B2	953565 EMB44	1994	110 PVC	38.4	21.3	0.16	1.00	30	AFDEV	
219 Nor MZ Migemezulu	1133B3	685493 EMB45	1994	110 (PVC)	40.0	18.4	0.06	0.67	27	AFDEV	
220 Nor MZ Mazini Jere	1133B3	651531 EMB46	1994	110 (PVC)	25.2	12.7	0.03	0.39	21	AFDEV	
221 Nor MZ Samala Ngumayo		EMB47	1994	110 PVC	34.2	12.4	0.02	0.33	30	AFDEV	
222 Nor MZ Machisano Mk.	1133B3	721673 EMB6	1993	110 (PVC)	40.6	2.9	0.02	0.56	36	AFDEV	
223 Nor MZ Sandile Mlotho. 1133B3	675355 EMB7	1994	110 (PVC)	20.0	6.3	0.08	0.90	15	AFDEV		
224 Nor MZ Kamwanjiwa TB	1133C2	448092 FC75	1993	110 PVC	42.4	8.2	0.01	0.15	33	AFDEV	
225 Nor MZ Eswazini Agricul 1133D1	506611 FC98	1992	110 (PVC)	31.0	1.6	0.02	0.51	21	AFDEV *	*	
226 Nor MZ Kasitu River	1133B2	979769 FM10	1993	110 (PVC)	14.2	4.8	0.52	2.22	9	AFDEV *	*
227 Nor MZ Mulera Nyirenda 1133B2	29758 FM11	1993	110 (PVC)	17.8	0.7	0.03	0.35	12	AFDEV *	*	
228 Nor MZ Ekwaiweni	1133B4	992383 FM12	1992	110 (PVC)	36.3	4.8	0.02	0.65	30	AFDEV *	*
229 Nor MZ Bulala H.Centre	1133C1	485094 FM122	1992	110 (PVC)	46.7	18.0	0.02	0.45	30	AFDEV	
230 Nor MZ Baula School	1133B4	851371 FM13	1993	110 (PVC)	42.4	8.2	0.01	0.15	33	AFDEV	
231 Nor MZ Eswazini Agr	1133D1	715036 FM20	1993	110 PVC	25.9	8.0	0.03	0.48	24	AFDEV *	*
232 Nor MZ Kafukule School 1133B3	688335 FM26	1993	110 (PVC)	45.9	16.2	0.07	0.91	27	AFDEV		
233 Nor MZ Kasenga School 1 1133A4	543467 FM27	1993	110 (PVC)	44.8	18.8	0.09	1.18	30	AFDEV		
234 Nor MZ Mchinkhula Sch 1133A4	412416 FM28	1993	110 (PVC)	47.7	10.0	0.02	0.45	33	AFDEV		
235 Nor MZ Kakombwe School 1134A4	353135 FM29	1993	110 (PVC)	60.9	18.0	0.03	1.00	33	AFDEV *	*	
236 Nor MZ Enukwени	1133B2	969643 FM71	1993	110 PVC	33.4	6.8	0.02	0.35	27	AFDEV	
237 Nor MZ Embombeni	1133B2	555557 FM9	1993	110 PVC	41.5	8.4	0.04	0.45	33	AFDEV *	*
238 Nor MZ Chimbwangundu	1133C4	360853 GK151	1992	110 PVC	41.5	11.6	0.01	0.25	33	AFDEV *	*
239 Nor MZ Mjinge Agt	1133C4	397815 GK153	1992	110 PVC	41.5						
240 Nor MZ Maloza Ziwa	1133C4	403873 GK155	1992	110 PVC							

APPENDIX 8.2

18-Aug-94

Page 8

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH. NO.	YEAR REH	CAS. SIZE mm	CAS. TYPE OF BH	WATER LEVEL m.b.s	SPEC CAP. 1/sec/m	MAX. YIELD m.b.s 1/sec	PUMP. DEPTH m	BACT. TYPE	CHEM PROB
241 Nor MZ Saimon Kumwenda	1133C4	412913	GK156	1992	110	PVC	42.9	7.4	0.005	0.15	1.2	AFDEV *
242 Nor MZ Qolocha Tembo	1133C4	36990	GK157	1992	110	PVC	45.4	9.0	0.01	0.45	3.3	AFDEV FC FS *
243 Nor MZ Madede H.Centre	1133C2	305229	GK158	1993	110	PVC	47.6	7.7	0.03	0.45	21	AFDEV
244 Nor MZ Chamunguma	1133C2	580265	GK159	1993	110	PVC	59.7	16.4	0.02	0.67	3.9	AFDEV FC FS
245 Nor MZ Euthini H/C	1133A3	453339	GK160	1994	110	PVC	41.0	5.0	0.01	0.49	3.6	AFDEV
246 Nor MZ Ndembala Vge.	1133C2	453202	GK161	1994	110	PVC	42.4	6.1	0.03	0.45	21	AFDEV
247 Nor MZ Magido D/Tank	1133C2	385170	GK162	1993	110	PVC	45.8	13.0	0.04	0.71	2.7	AFDEV *
248 Nor MZ Samuel Makwakwa	1133B3	719525	GK165	1993	110	PVC	41.0	13.4	0.01	0.35	3.3	AFDEV *
249 Nor MZ Edundu D/Tank	1133B4	848422	GK175	1993	110	PVC	46.0	7.2	0.11	0.65	3.3	AFDEV
250 Nor MZ Kamchocho R.cam	1133C2	444106	GK34	1993	110	PVC	45.7	8.9	0.03	0.90	3.3	AFDEV
251 Nor MZ Chindokwa Jonas	1233A4	529459	GK36	1992	110	PVC	47.0	11.9	0.11	1.11	2.4	AFDEV *
252 Nor MZ Mtwalio Turn Off	1133B3	881396	GK37	1993	110	PVC	61.5	11.7	0.08	1.11	2.7	AFDEV *
253 Nor MZ Sokopo T.Centre	1133B3	711409	GK38	1993	110	PVC	60.0	13.0	0.03	0.57	3.9	AFDEV *
254 Nor MZ Mzambazi Mission	1133A4	489369	GK396	1994	110	(PVC)	46.5	2.5	0.17	1.11	2.1	AFDEV *
255 Nor MZ Ejezeni	1133C2	451266	GK40	1993	110	PVC	31.0	5.1	0.07	1.10	2.1	AFDEV *
256 Nor MZ Elangeni D/Tank	1133B3	804353	GK41	1993	110	PVC	19.5	4.4	0.04	0.45	1.2	AFDEV *
257 Nor MZ Dunduzu Quary	1133B4	9627	GK42	1993	110	PVC	47.3	12.6	0.02	0.65	3.3	AFDEV *
258 Nor MZ Phazima	1233A2	535709	H11	1992	110	PVC	36.6	12.2	0.02	0.35	3.0	AFDEV *
259 Nor MZ Mpangavisoti	1133C4	497745	H12	1992	110	PVC	35.8	9.5	0.01	0.25	3.0	AFDEV *
260 Nor MZ Aron Hara	1133C4	462444	H13	1992	110	PVC	60.0	8.7	0.01	0.25	3.3	AFDEV *
261 Nor MZ Bichi Mumba	1133C4	148747	H14	1992	110	PVC	56.7	7.5	0.01	0.25	3.0	AFDEV *
262 Nor MZ Thomas Nyirenda	1133C4	444820	H15	1992	110	PVC	46.7	10.0	0.01	0.25	3.0	AFDEV *
263 Nor MZ Mtola Bota	1133C4	450828	H16	1992	110	PVC	50.8	6.2	0.01	0.35	3.3	AFDEV *
264 Nor MZ Mteyo Ng'oma	1133C4	487791	H17	1992	110	PVC	51.1	5.2	1.13	1.30	3.3	AFDEV *
265 Nor MZ Dikison Sakara	1134C4	475832	H18	1993	110	PVC	45.0	11.2	0.04	0.90	3.3	AFDEV *
266 Nor MZ Biwe	1133C4	498855	H19	1993	110	PVC	28.9	5.5	0.01	0.15	2.1	AFDEV *
267 Nor MZ Katondo	1233A2	420644	H2	1992	110	PVC	28.9	8.9	0.04	0.65	3.3	AFDEV *
268 Nor MZ Daniel Tembo	1133C4	479914	H20	1992	110	PVC	40.9	8.9	0.04	0.65	3.3	AFDEV *
269 Nor MZ Damaseki Sch	1133D3	586855	H24	1992	110	PVC	40.9	8.9	0.04	0.65	3.3	AFDEV *
270 Nor MZ Chingati Chirwali	1133C4	520816	H25	1992	110	PVC	40.9	8.9	0.04	0.65	3.3	AFDEV *

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

REG DIST LOCALITY	MAP SHEET NO.	GRID REF.	YR NO.	CAS. REH	CAS. SIZE mm	DEPTH TYPE OF BH m.b.s	WATER LEVEL m.b.s	SPEC CAP.	MAX YIELD 1/sec	PUMP PROB.	BACT 1/m	CHEM PROB.	PROB.
271 Nor MZ Engalaweni	1133C3	396841 H27	1992	110 PVC	16.7	9.8	0.04	0.15	12	AFDEV *	*	*	*
272 Nor MZ Ntondanjala	Nyi1133C4	384807 H28	1992	110 PVC	28.5	8.7	0.02	0.25	24	AFDEV *	*	*	*
273 Nor MZ Kamteka Sch	1133C4	388967 H29	1992	110 PVC	17.0	9.2	0.08	0.45	12	AFDEV *	*	*	*
274 Nor MZ Njembwa 1	1233A2	424659 H3	1992	110 PVC	61.6	10.0	0.01	0.35	33	AFDEV *	*	*	*
275 Nor MZ Dokowe	1133C4	388919 H30	1992	110 PVC	28.7	9.7	0.01	0.15	21	AFDEV *	*	*	*
276 Nor MZ Mpensi School	1133C4	352890 H31	1992	110 PVC	29.6	7.3	0.02	0.35	24	AFDEV *	*	*	*
277 Nor MZ Chuya Nkhata	1133C4	359807 H32	1992	110 PVC	20.0	5.6	0.69	0.90	15	AFDEV *	*	*	*
278 Nor MZ Kabuku Phiri	1133C4	369788 H33	1992	110 PVC	28.3	7.8	0.02	0.35	21	AFDEV *	*	*	*
279 Nor MZ Zikoti Saka	1133C4	365761 H34	1992	110 PVC	25.0	6.3	0.03	0.35	18	AFDEV *	*	*	*
280 Nor MZ Paulosi Nthara	1133C4	345762 H35	1992	110 PVC	38.0	6.9	0.04	0.90	33	AFDEV *	*	*	*
281 Nor MZ William Ngwenya1233A2	367703 H36	1992	110 PVC	18.6	5.0	0.07	0.90	15	AFDEV *	*	*	*	
282 Nor MZ Handile Ndhlovu1233A2	495673 H4	1992	110 PVC	37.8	12.5	0.05	0.90	27	AFDEV *	*	*	*	
283 Nor MZ Handile Ndhlovu1233A2	498674 H5	1992	110 PVC	42.3	12.5	0.01	0.35	33	AFDEV FC FS	*	*	*	
284 Nor MZ Kasichi Myula	1233A2	348520 H50	1992	110 PVC	26.2	6.3	0.01	0.25	21	AFDEV *	*	*	*
285 Nor MZ Chisembezo Band1233A2	385606 H51	1992	110 PVC	24.0	5.4	0.15	0.45	18	AFDEV *	*	*	*	
286 Nor MZ Isaac Lukhunda	1233A2	373518 H52	1992	110 PVC	31.8	4.7	0.02	0.35	24	AFDEV *	*	*	*
287 Nor MZ Kambokoto	1233A2	383577 H53	1992	110 PVC	40.5	7.4	0.01	0.15	33	AFDEV *	*	*	*
288 Nor MZ Mudima Mwandira1233A4	479370 H54	1992	110 PVC	32.0	4.9	0.02	0.35	21	AFDEV *	*	*	*	
289 Nor MZ Malembo	1233A2	450385 H55	1992	110 PVC	31.7	9.0	0.03	0.90	27	AFDEV EC *	*	*	*
290 Nor MZ Kamalimbwe Sch	1233A4	426401 H56	1992	110 PVC	33.0	6.7	0.02	0.35	27	AFDEV *	*	*	*
291 Nor MZ Kanyolokera	1233A4	399385 H57	1992	110 PVC	39.3	6.8	0.02	0.45	33	AFDEV *	*	*	*
292 Nor MZ Vakaza Banda	1233A2	399462 H58	1992	110 PVC	38.6	9.0	0.02	0.45	30	AFDEV *	*	*	*
293 Nor MZ Dulu Nkhunga	1233A4	455457 H59	1992	110 PVC	44.7	5.4	0.01	0.65	33	AFDEV *	*	*	*
294 Nor MZ Mbobo	1233A2	514673 H6	1992	110 PVC	45.5	11.8	0.03	0.90	33	AFDEV *	*	*	*
295 Nor MZ Hannock Mshanga1233A4	508378 H60	1992	110 PVC	25.5	7.8	0.04	0.65	21	AFDEV				
296 Nor MZ Mlaba Handa	1233A3	450518 H62	1992	110 PVC	26.8	6.5	0.02	0.35	24	AFDEV			*
297 Nor MZ Baleni Jere	1233A2	510491 H63	1992	110 PVC	36.0	14.2	0.01	0.25	33	AFDEV *	*	*	*
298 Nor MZ Mabvutoza Nkhat1233A4	509445 H64	1992	110 PVC	37.2	6.9	0.02	0.65	30	AFDEV *	*	*	*	
299 Nor MZ Aron Chirwa	1233A2	478465 H65	1992	110 PVC	31.4	6.4	0.04	0.90	27	AFDEV FC FS			
300 Nor MZ Mapupo Ndhlovu	1233A2	468475 H66	1992	110 PVC	31.4	6.4	0.04	0.90	27	AFDEV FC FS			

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST	LOCALITY	MAP SHEET NO.	GRID REF	BH REH	CAS. SIZE	DEPTH	WATER LEVEL	SPEC CAP.	MAX YIELD	PUMP DEPTH	BACT TYPE	CHEM PROB
				MM	m.b.s	1/sec	m	1/sec	1/sec	MM		MM
301	Nor MZ	Kabinga Banda	1233A2	415529 H67	1992	110 PVC	42.0	3.7	0.05	0.25	24	AFDEV * FS
302	Nor MZ	Matekenya Jere	1233A2	399462 H68	1992	110 PVC	41.0	7.8	0.05	0.35	33	AFDEV * *
303	Nor MZ	Chilomba	1233A2	387524 H69	1992	110 PVC	21.5	4.5	0.03	0.45	15	AFDEV FC *
304	Nor MZ	Katambalaia	1233A2	473690 H7	1992	110 PVC	35.8	9.0	0.02	0.35	30	AFDEV * *
305	Nor MZ	Bori Nyirenda	1233A2	388537 H70	1992	110 PVC	25.5	5.2	0.45	0.45	18	AFDEV *
306	Nor MZ	Kapoli Mtonga	1233A2	387524 H71	1992	110 PVC	37.5	3.9	0.04	0.35	30	AFDEV
307	Nor MZ	Bongoya Msimuko	1233A2	428555 H72	1992	110 PVC	32.5	6.0	0.02	0.45	24	AFDEV *
308	Nor MZ	Eziakimo Jere	1233A2	417531 H73	1992	110 PVC	31.7	7.0	0.03	0.35	24	AFDEV *
309	Nor MZ	Mpezeni Msimuko	1233A2	419523 H74	1992	110 PVC	32.0	4.8	0.02	0.25	33	AFDEV *
310	Nor MZ	Malepa Manda	1233A2	457570 H75	1992	110 PVC	29.2	5.1	0.01	0.25	18	AFDEV *
311	Nor MZ	Mfawvi	1233A2	440573 H76	1992	110 PVC	41.0	6.2	0.01	0.25	23	AFDEV *
312	Nor MZ	Kamtapa Mwale	1233A2	463707 H8	1992	110 PVC	32.5	10.5	Test not Clear	15	*	*
313	Nor MZ	Mtezi Miti	1133C4	345742 H81	1992	110 PVC	28.6	9.1	0.04	0.90		
314	Nor MZ	Kaeleka	1133C4	H9	1993	PVC	Abandoned due to low yield					
315	Nor MZ	Kapilingo School	1133B3	602373 IR112	1993	110 PVC	42.7	9.1	0.07	0.74	21	AFDEV *
316	Nor MZ	Chamunguma Sch	1133C2	487266 IR114	1993	110 PVC	48.0	10.5	0.26	0.74	24	AFDEV
317	Nor MZ	Phala School	1133C2	357078 IR115	1993	110 PVC	29.6	6.2	0.01	0.15	24	AFDEV
318	Nor MZ	Jeremia Village	1133A3	431465 IR116	1994	(PVC)	48.1	17.0	0.02	0.45	39	AFDEV *
319	Nor MZ	Kamwe School	1133B2	849709 IR42	1993	110 PVC	39.4	8.0	0.03	0.67	33	AFDEV *
320	Nor MZ	Jeremia Mkwemani	1133A3	433464 IR45	1994	110 PVC	30.0	6.2	0.04	0.63	27	AFDEV
321	Nor MZ	Timothy Mphaka	1133C4	377997 IR62	1992	110 PVC	40.4	10.8	0.04	1.00	33	AFDEV
322	Nor MZ	Elangeni Sch	1133B3	804354 IR64	1993	110 PVC	29.8	14.5	0.04	0.50	30	AFDEV *
323	Nor MZ	Njoka Sch	1133C4	511751 IR65	1992	110 PVC	40.3	11.1	0.03	0.65	33	AFDEV
324	Nor MZ	Lusangadzi Sch.	1133B4	2525 IR67	1994	110 PVC	38.5	2.8	0.01	0.17		
325	Nor MZ	Chisasa Agr	1133C4	519988 IR69	1993	110 PVC	18.6	8.3	0.04	0.35	15	AFDEV
326	Nor MZ	Lusangadzi Vge.	1133B2	25250 IR81	1994	PVC	Abandoned due to Obstruction					
327	Nor MZ	Edingeni Disp	1233A2	334682 IR84	1992	110 PVC	49.6	9.8	0.01	0.35	33	AFDEV
328	Nor MZ	Kalungulu Sch	1233A2	522638 IRS5	1992	110 PVC	48.0	9.3	0.03	0.90	33	AFDEV *
329	Nor MZ	Chibembe School	1133D1	732001 IRS6	1993	110 PVC	39.5	7.9	0.01	0.25	30	AFDEV
330	Nor MZ	Endingeni H.Ctr	1133D3	645958 IRS7	1992	110 PVC	57.5	7.0	0.01	0.50	33	AFDEV FC FS

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH.	CAS. SIZE	DEPTH OF BH.	WATER LEVEL	SPEC CAP.	MAX YIELD 1/sec.	PUMP CAP. 1/sec.	PUM. DEPTH m.	BACT TYPE	PROB.	CHEM PROB.
mm	mm	m.b.s	m.b.s	mm	m	m	m	l/sec/m	l/sec	l/sec	m			
331 NOR MZ Ethuleni Sch	1133C2	368275	IRSS	1993	110 PVC	43.2	16.1	0.11	1.00	21	AFDEV			
332 NOR MZ Mahuza	1133B3	687442	K160	1993	110 PVC	35.8	0.0	0.11	0.91	21	AFDEV			
333 NOR MZ Kalama Sch.	1133B2	852651	KB149	NEW/93	110 PVC	40.6	6.5	0.09	1.33	33	AFDEV	*	*	
334 NOR MZ Embombeni Sch.	1133B2	555557	KB150	NEW/93	110 PVC	23.1	2.1	0.74	1.67	9	AFDEV			
335 NOR MZ Alifeyo Mjuma	1133B1	763674	KK134b	1994	110 Steel	17.5	6.0	0.08	0.71	15	AFDEV			
336 NOR MZ Mtwalo Vge			KK15	1994	110 PVC	77.5	24.9	0.02	0.50		CLIMAX			
337 NOR MZ Enterera	1133A4	459343	KK221	1993	110 PVC	59.6	18.9	0.07	1.11		AFDEV	*	*	
338 NOR MZ Moses Mzima	1133A4	443303	KK222	1993	110 PVC	60.4	7.2	0.02	0.74	33	AFDEV			
339 NOR MZ Kanyankhunde Sc	1133C2	395248	KK223	1993	110 PVC	46.1	7.8	0.02	0.75	33	AFDEV			
340 NOR MZ Bulala Agr	1133C2	484091	KK224	1992	110 PVC	36.8	3.5	0.05	1.50	30	AFDEV			
341 NOR MZ Malinyeti Schoo	1133D1	562073	KK225	1993	110 PVC	46.0	6.4	0.02	0.75	33	AFDEV	FC	FS	
342 NOR MZ Visenthe Sch	1133C2	532040	KK226	1993	110 PVC	29.9	8.1	0.04	0.75	27	AFDEV			
343 NOR MZ Njewe School	1233D1	671108	KK7	1992	110 PVC	61.9	5.9	0.02	2.00	33	AFDEV			
344 NOR MZ Euthini Sec Sch.			KK01	1994	110 PVC	63.0	4.7	0.02	0.67	39	AFDEV			
345 NOR MZ Chief Chindi			KK02	1994	150 PVC	54.7	20.5	0.08	1.18		AFDEV			
346 NOR MZ Euthini Agr.			KK03	1994	110 PVC	63.3	8.3	0.01	0.36	39	AFDEV			
347 NOR MZ Chimkwayaya			KK04	1994	110 PVC	36.5	6.1	0.01	0.19	36	AFDEV			
348 NOR MZ Mwango Juwa			KK05	1994	110 PVC	49.4	3.7	0.04	1.00	36	AFDEV			
349 NOR MZ Chitchoka Vge.			KK06	1994	110 PVC	38.0	7.8	0.03	0.61	33	AFDEV			
350 NOR MZ Zitchoka Vge.			KK07	1994				Abandoned due to Collapsing						
351 NOR MZ Mpherembe T.C	1133A2	208507	L400	1993	110 PVC	61.5	14.7	0.01	0.36	33	AFDEV	*	*	*
352 NOR MZ Emchisweni	1133B3	668524	L404	1993	110 Steel	30.0	9.5	0.02	0.33	24	AFDEV	*	*	
353 NOR MZ Ethererera	1133A4	452344	L406	1994	110 PVC	45.5	16.2	0.09	1.18	33	AFDEV	*	*	
354 NOR MZ Zombwe Agr	1133B4	904489	L410	1993	110 PVC	37.0	17.6	0.18	2.00		AFDEV			
355 NOR MZ Mahuza Mzima	1133B2	893644	L412	1993	110 PVC	32.4	5.8	-9.00	0.24	24	AFDEV	*	*	
356 NOR MZ Emanyaleni	1133B2	893644	L412A	1993	110 PVC	45.6	13.9	0.02	0.47	33	AFDEV	*	*	
357 NOR MZ Mbawa Agr.	1233A2	445614	L413	1992	110 PVC	41.5	6.6	0.38	3.00	30	AFDEV	*	*	
358 NOR MZ Edingeni Sch.	1233A2	682335	L414	1992	110 PVC	46.0	12.7	0.05	1.50	33	AFDEV	*	FS	
359 NOR MZ Jenda Agr	1233B3	595348	L417	1992	110 PVC	32.2	10.7	0.07	0.75	24	AFDEV	*	*	
360 NOR MZ Emfeni School	1233D1	650078	L418	1992	110 PVC									

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST	LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE	DEPTH OF BH	WATER LEVEL	SPEC CAP.	MAX YIELD	PUMP. DEPTH	BACT TYPE	CHEM PROB
mm	m	m.b.s	m.b.s	m.b.s	1/sec/m	1/sec	m	m	1/sec/m	l/sec	m		
361	Nor MZ	Levi Jere	1233B3	603341	PCI132	NEW/92	110	PVC	40.9	5.8	0.23	0.72	3.3 AFDEV *
362	Nor MZ	Mqocha	1233A4	539370	PCI136	NEW/92	110	PVC	42.0	10.0	0.09	0.83	3.3 AFDEV *
363	Nor MZ	Ntchawaka	1233B3	613187	PCI137	NEW/92	110	PVC	36.8	9.3	0.10	2.00	2.7 AFDEV *
364	Nor MZ	Embangweni T.C	1233A2	528583	PCI138	NEW/92	110	PVC	40.0	8.5	0.25	0.72	3.3 AFDEV *
365	Nor MZ	Mlaba Handa	1233A3	450518	PCI150	NEW/92	110	PVC	35.0	6.5	1.03	1.54	3.0 AFDEV *
366	Nor MZ	Edingeni	1233A2	345687	PCI154	NEW/92	110	PVC	40.1	10.1	0.03	0.75	3.3 AFDEV *
367	Nor MZ	Mhlafula Sch	1233D1	458387	PCI155	NEW/92	110	PVC	36.1	7.4	0.08	1.50	3.0 AFDEV *
368	Nor MZ	Mbelwa D.Council	1233A2	331695	PCI157	NEW/92	110	PVC	42.9	11.7	0.05	1.30	3.3 AFDEV *
369	Nor MZ	Mharauanda	1233A2	517682	PCI160	NEW/93	110	PVC	36.0	15.9	0.12	2.00	AFDEV *
370	Nor MZ	Mjinge Schoo1	1133C4	395808	PCI161	NEW/92	110	PVC	25.0	9.3	0.17	2.00	1.5 AFDEV FC *
371	Nor MZ	Euthini Sec Schi	1133A4	439342	PCI165	NEW/93	110	PVC	40.2	1.4	0.06	1.11	AFDEV *
372	Nor MZ	Kayeleka	1133C4	PC175	NEW/93	110	PVC	26.0	8.6	0.17	2.00	2.1 AFDEV *	
373	Nor MZ	Ejezeni Vge.	1133B2	903623	PCI195	NEW/94	110	PVC	28.5	9.6	0.01	0.10	2.1 MOTOR
374	Nor MZ	Engucwini	1133B3	900627	PCI196	NEW/93	110	PVC	27.1	9.6	0.01	0.10	2.7 AFDEV *
375	Nor MZ	Mzambazi	1133A4	487365	PCI199	NEW/93	110	PVC	35.1	7.6	0.04	0.77	CLIMAX
376	Nor MZ	Kafukule R.Camp	1133B3	687334	PC66	1993	110	PVC	30.8	11.7	0.03	0.50	2.4 AFDEV *
377	Nor MZ	Malinyete Admarc		PC78	1994	110	(PVC)	32.1	3.0	0.01	0.14	2.4 AFDEV *	
378	Nor MZ	Lusangazi H/C	1133B4	55262	PM118	1994	110	(PVC)	49.9	4.4		3.9 AFDEV *	
379	Nor MZ	Manyamula H.C	1133C4	483803	PM142	1992	110	PVC	48.3	10.5	0.03	1.00	3.3 AFDEV *
380	Nor MZ	Mgazzze	1133C4	344776	PM144	1992	110	PVC	76.0	4.7	0.02	1.50	3.3 AFDEV *
381	Nor MZ	Chikapu Moyo	1133C4	378873	PM145	1992	110	PVC	42.4	9.0	0.12	2.00	3.3 AFDEV *
382	Nor MZ	Kamteteka	1133C4	388943	PM146	1992	110	PVC	45.5	3.5	0.05	1.00	3.3 AFDEV *
383	Nor MZ	Wetereka Sch	1133D3	744805	PM151	1993	110	PVC	85.0	6.2	0.30	3.00	3.3 AFDEV *
384	Nor MZ	Kazingilila Sch	1233B3	714427	PM152	1992	110	PVC	45.6	13.5	0.03	1.00	3.3 AFDEV *
385	Nor MZ	Kamunjiri D.Tan	1233D1	712003	PM154	1992	110	PVC	93.3	11.3	0.01	0.25	3.3 AFDEV *
386	Nor MZ	David Jere	1233D1	638125	PM155	1992	110	PVC	45.1	10.8	0.09	3.00	3.3 AFDEV *
387	Nor MZ	Matandani D/Tan	1133D3	775946	PM156	1993	110	PVC	48.8	1.1	0.11	3.00	3.3 AFDEV *
388	Nor MZ	Mathendani Sch	1133D3	777955	PM157	1993	110	PVC	47.4	13.2	0.04	0.80	3.0 AFDEV *
389	Nor MZ	Magido D/Tank	1133D1	525583	PM162	1993	110	PVC	42.4	6.1	0.04	1.00	2.7 AFDEV *
390	Nor MZ	Mvakule	1133D3	556858	PM164	1992	110	PVC	50.3	6.5	0.19	1.00	3.0 AFDEV *

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE mm	CAS. TYPE	DEPTH OF BH. m.b.s	WATER LEVEL m.b.s	SPEC CAP. 1/sec/m	MAX YIELD 1/sec	PUMP PUM. PROB.	BACT. PROB.	CHEM PROB.	
391 Nor MZ	Mathambo Ngulub1133A2	353729	PM324	1992	110	PVC	55.0	7.8	0.05	2.00	33	AFDEV *	*	
392 Nor MZ	Vuta Chipeta	1133C4	384842	PM325	1992	110	PVC	46.4	8.2	0.29	2.00	33	AFDEV *	*
393 Nor MZ	Chisebe	1133C4	392952	PM326	1992	110	PVC	45.5	6.9	0.56	1.50	33	AFDEV *	*
394 Nor MZ	Peter Ndabandab1133D3	608827	PM332	1992	110	PVC	46.8	7.9	0.10	2.00	33	AFDEV *	*	
395 Nor MZ	Engongolweni Sc1133B4	960474	PM336	1993	110	PVC	61.9	17.7	0.05	1.75	33	AFDEV *	*	
396 Nor MZ	Mtembalibwe	1133B4	841508	PM338	1994	110	PVC	40.7	5.5	0.03	0.69	33	AFDEV *	*
397 Nor MZ	Kapando ADMARC 1133A4	523445	PM341	1993	110	PVC	32.8	6.8	0.04	0.80	27	AFDEV *	*	
398 Nor MZ	Robert Mtika 1133A4	535347	PM342	1993	110	PVC	36.6	7.7	0.02	0.49	24			
399 Nor MZ	Zowe School	1133A2	535355	PM343	1993	110	PVC	43.9	9.6	0.25	0.83	24	AFDEV *	*
400 Nor MZ	Mzalangwe ADMAR1133D1	625174	PM344	1993	110	PVC	47.5	14.2	0.02	0.50	30	AFDEV *	*	
401 Nor MZ	Mqocha ADMARC 1233A2	338463	PM407	1992	110	PVC	46.0	10.2	0.10	1.50	33	AFDEV *	*	
402 Nor MZ	David Mumba 1133C4	448795	PM507	1992	110	EVC	64.7	25.5	0.03	0.50	33	AFDEV *	*	
403 Nor MZ	Chibuwu 1133C4	408845	PM530	1992	110	PVC	26.5	7.1	0.05	0.25	21	AFDEV *	*	
404 Nor MZ	Kabuku Nyirenda1133C4	394788	PM531	1992	110	PVC	46.8	3.8	0.06	1.50	33	AFDEV *	*	
405 Nor MZ	Simiyoni Mvula 1133D3	632872	PM534	1992	110	PVC	62.6	10.4	0.02	0.50	33	AFDEV *	*	
406 Nor MZ	Mnyehene Chipet1133D3	603846	PM535	1992	110	PVC	48.5	5.5	0.09	1.00	33	AFDEV *	*	
407 Nor MZ	Kaluweya 1133C4	479872	PM536	1992	110	PVC	45.3	13.5	0.35	1.00	33	AFDEV *	*	
408 Nor MZ	Ndembera Sch 1133C2	451162	PM537	1993	110	PVC	23.2	10.1	0.02	0.25	18	AFDEV *	*	
409 Nor MZ	Euthini P.Sch 1133A4	464329	PM539	1993	110	PVC	39.4	4.4	0.25	1.00	15	AFDEV *	*	
410 Nor MZ	Kamwanga Sch 1133A4	529290	PM540	1993	110	PVC	46.8	10.2	0.01	0.22	36	AFDEV *	*	
411 Nor MZ	Mallidade Disp 1133A2	547588	PM542	1993	110	PVC	41.3	12.7	0.01	0.35	33	AFDEV *	*	
412 Nor MZ	Thomas Nyirongo1133B3	704361	PM544	1993	110	PVC	47.0	3.3	0.03	0.80	24	AFDEV *	*	
413 Nor MZ	Mpherembe Agr. 1133B3	661528	PM545	1994	110	PVC	33.5	8.1	0.01	0.24	30	AFDEV *	*	
414 Nor MZ	Mpherembe ADMAR1133B3	661528	PM584	1994	110	PVC	45.5	6.5	0.01	0.29	39	AFDEV *	*	
415 Nor MZ	Enukwenu School1133B2	965646	PM71	1994										
416 Nor MZ	Matala School 1133B3	665423	PP10	1994	110	(PVC)	36.2	13.3	0.15	0.95	24	AFDEV *	*	
417 Nor MZ	Kapando D/Tank 1133A4	539465	PP119	1994	110	(PVC)	45.5	3.1			30	AFDEV *	*	
418 Nor MZ	Lukwelukwe Admarc	PP123	1994											
419 Nor MZ	Mkhwangwari ADM1133B3	578411	PP124	1993	110	(PVC)	45.2	7.9	0.00	0.02	33	AFDEV *	*	
420 Nor MZ	Njuyu 1 1133D1	750260	PP125	1993	110	(PVC)	58.7	14.4	0.11	0.69	21	AFDEV *	*	

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE mm	DEPTH m.b.s	WATER LEVEL m.b.s	SPEC CAP. 1/sec/m	MAX YIELD 1/sec	PUMP. PROB. %	BACT. PROB. %	CHEM. PROB. *
Abandoned due to low yield												
4.21 Nor MZ	Eswazin Input	1133D1	708035	PP131	1993	110	PVC	39.0	14.2	0.04	0.61	30 AFDEV
4.22 Nor MZ	Geza School	1133A3	418469	PP137	1994	110	PVC	48.7	24.1	0.04	0.82	36 AFDEV
4.23 Nor MZ	Thunduwike H.Ctr	1133B1	615655	PP14	1993	110	(PVC)	30.6	22.1	0.20	1.00	24 AFDEV *
4.24 Nor MZ	Mzalangwe H.Ctr	1133D1	614168	PP3	1993	110	(PVC)	61.2	6.0	0.01	0.37	33 AFDEV
4.25 Nor MZ	Mbalachanda	1133A4	409446	PP30	1993	110	(PVC)	31.7	8.4	0.05	0.80	27 AFDEV
4.26 Nor MZ	Katongomala Vge	1133A3	380360	PP31	1994	110	PVC	40.1	4.7	0.29	1.33	21 AFDEV
4.27 Nor MZ	Jinga Kambwili	1133C2	462147	PP32	1993	110	(PVC)	29.2	5.4	0.11	1.00	21 AFDEV
4.28 Nor MZ	Kaluvelo Vge.	1133C1	329263	PP33	1994	110	(PVC)	34.0	11.4	0.90	1.54	27 AFDEV
4.29 Nor MZ	Lunda Lusale	1133C2	321249	PP34	1994	110	(PVC)	39.9	6.5	0.03	0.80	30 AFDEV
4.30 Nor MZ	Ndakhala Chavini	1133C1	305229	PP35	1994	110	(PVC)	32.0	10.6	0.07	1.00	27 AFDEV
4.31 Nor MZ	Manolo School	1133A4	463507	PP36	1993	110	(PVC)	45.5	6.7	0.06	1.25	30 AFDEV
4.32 Nor MZ	Chimango Vge.	1133B3	552431	PP38b	1994	110	(PVC)	52.4	1.7	0.01	1.00	30 AFDEV *
4.33 Nor MZ	Genesesi Mzima	1133A4	540471	PP38b	1994	110	(PVC)	46.5	3.2	0.14	0.44	21 AFDEV
4.34 Nor MZ	Kenani Chongwe	1133B3	695312	PP4	1993	110	(PVC)	44.5	1.0	0.01	0.49	39 AFDEV
4.35 Nor MZ	Makhuwalo Vge.	1133A2	443442	PP42	1994	110	(PVC)	42.4	4.8	0.01	0.50	36 AFDEV
4.36 Nor MZ	Bundi Chikoswe	1133A4	434433	PP43	1994	110	PVC	37.4	2.9	0.01	0.33	33 AFDEV
4.37 Nor MZ	Tondo Village	1133A3	481320	PP45	1994	110	(PVC)	42.3	9.5	0.05	0.91	33 AFDEV
4.38 Nor MZ	Luji Phiri	1133C2	409217	PP47	1994	110	(PVC)	40.0	4.9	0.06	1.54	33 AFDEV
4.39 Nor MZ	Joweka Phiri	1133C2	386232	PP48	1994	110	(PVC)	33.6	4.1	0.06	1.00	27 AFDEV
4.40 Nor MZ	Chinkhutha Vge.	1133C1	244476	PP49	1994	110	(PVC)	46.0	8.2	0.03	1.00	33 AFDEV
4.41 Nor MZ	Reuben Lungu	1133A3	453294	PP50	1993	110	(PVC)	28.7	8.3	0.05	0.74	18 AFDEV
4.42 Nor MZ	Ndisani Zima	1133A3	445365	PP51	1993	110	(PVC)	41.3	10.8	0.05	1.00	33 AFDEV *
4.43 Nor MZ	Mkhweta Vge.	1133A3	456357	PP52	1994	110	(PVC)	24.5	7.3	0.02	0.32	18 AFDEV
4.44 Nor MZ	Thatuya Mtula	1133A3	439329	PP53	1993	110	(PVC)	31.2	7.7	0.02	0.50	27 AFDEV
4.45 Nor MZ	Daudi Mbidi	1133A4	454294	PP56	1993	110	PVC	36.7	21.5	0.02	0.22	33 AFDEV
4.46 Nor MZ	Malidade	1133B1	591569	PP6	1993	110	(PVC)	45.0	11.7	0.25	2.00	27 AFDEV *
4.47 Nor MZ	Emfeni Dispensal	1233D1	647079	PP7	1992	110	PVC	45.0	6.8	0.06	1.18	27 AFDEV *
4.48 Nor MZ	Kafukule Dispensal	1133B3	691337	PP9	1993	110	PVC	29.5	8.3	0.01	0.25	24 AFDEV FC FS
4.49 Nor MZ	Kamteteka H.Ctr	1133C4	389923	PP96	1993	110	PVC	23.0	9.0	0.06	0.75	18 AFDEV
4.50 Nor MZ	Chizungu School	1133C4	470997	Q137	1992	110	PVC	0.06	0.06			

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

REG	DIST	LOCALITY	MAP SHEET	GRID REF.	BH NO.	YEAR REH.	CAS. SIZE	DEPTH OF BH	WATER LEVEL	SPEC CAP.	MAX YIELD	PUMP 1/sec	BACT PROB	CHEM PROB
						mm	m.b.s	m.b.s	m.b.s	1/sec/m	l/sec	m		
451	NOR MZ	Muthini Ag.	1133A4	465341 Q145	1994	110 PVC	37.9	10.3	0.01	0.23	33	AFDEV	*	*
452	NOR MZ	Chikosa-ADMARC	1134C4	539931 Q146	1993	110 PVC	43.6	10.3	0.03	0.75	33	AFDEV		
453	NOR MZ	Chikosa Gondwe	1133D3	552992 Q147	1993	110 PVC	36.5	5.5	0.10	1.00	30	AFDEV		
454	NOR MZ	Dinie! Mgogno	1133D3	396969 Q148	1992	110 PVC	36.9	8.2	0.04	1.00	30	AFDEV		
455	NOR MZ	Kapinyuka	1133C4	395003 Q149	1992	110 PVC	37.6	6.6	0.02	0.50	30	AFDEV		
456	NOR MZ	Kapolo Police	1233A4	418356 Q151	1992	110 PVC	33.6	7.7	0.05	1.00	27	AFDEV	*	Fe
457	NOR MZ	571 Dispensa	1233D1	662079 Q312	1992	110 PVC	36.3	8.3	0.28	2.50		AFDEV		
458	NOR MZ	Chidisa Kamwe	1133E2	8655721 Q393	1993	110 PVC	39.0	10.1	0.13	0.95	24	AFDEV	*	*
459	NOR MZ	Mpherembe D/Tan	1133B3	675528 Q395	1993	110 PVC	45.8	5.5	0.09	1.00	24	AFDEV	*	*
460	NOR MZ	Kabila	1133B2	894654 Q93	1993	110 PVC	47.7	12.1	0.12	1.25	24	AFDEV	*	*
461	NOR MZ	Chindiwira	1133B2	13762 Q97	1993	110 PVC	35.6	8.6	0.02	0.41	27	AFDEV	*	FS
462	NOR MZ	Samala & Mqumayo		R167	1994	110 PVC	43.0	20.0	0.23	1.05	36	AFDEV		*
463	NOR MZ	Emfeni Agr	1233D1	662072 R172	1992	110 PVC	45.7	9.5	0.07	3.00	33	AFDEV	*	*
464	NOR MZ	Manyamula Agr	1133C4	488815 R176	1992	110 PVC	38.4	10.5	0.08	0.50	33	AFDEV	*	*
465	NOR MZ	Mbawe School	1233A2	455601 R178	1992	110 PVC	43.0	8.4	0.07	2.00	33	AFDEV	*	*
466	NOR MZ	Chibeku Nguluwe	1233A2	306654 R179	1992	110 PVC	39.4	9.1	0.07	2.00	33	AFDEV	*	*
467	NOR MZ	Kholwani Lungu	1133C4	361923 R180	1992	110 PVC	46.4	4.7	0.02	0.75	33	AFDEV	*	*
468	NOR MZ	Ramangadazi	1133C4	443938 R181	1993	110 PVC	40.6	12.8	0.02	0.50	33	AFDEV		
469	NOR MZ	Chigowo	1133A4	471433 R182	1993	110 PVC	44.0	3.4	0.12	1.11	24	AFDEV		
470	NOR MZ	Chavirwa Schoo	1133A4	528537 R183	1993	110 PVC	27.0	8.7	0.03	0.57	24	AFDEV		
471	NOR MZ	M'ngoni Wamavi	1133C4	414936 R187	1992	110 PVC	39.8	12.7	0.10	1.50	33	AFDEV	*	*
472	NOR MZ	Chitikoto Vge.	1133B2	13787 R193	1993	110 PVC	46.2	7.6	0.04	0.74	30	AFDEV	*	
473	NOR MZ	Moses Chilensi	1233B2	440685 R216	1993	110 PVC	45.7	9.0	0.01	0.50	33	AFDEV	*	
474	NOR MZ	Buwwere	1133B3	737408 R7	1993	110 PVC	44.8	2.5	0.02	0.51	24	AFDEV	*	
475	NOR MZ	Kaluwe School	1233A4	525413 RB76	1992	110 PVC	47.0	9.8	0.05	1.50	33	AFDEV		
476	NOR MZ	Kalikumbi School	1233A2	359555 RB78	1992	110 PVC	59.6	7.8	0.01	0.25	33	AFDEV		
477	NOR MZ	Kalikumbi	1233A2	303567 RB79	1992	110 PVC	44.9	8.7	0.03	1.00	33	AFDEV		
478	NOR MZ	Baphani Settle	1133D1	646056 RB80	1993	110 PVC	41.8	11.0	0.02	0.50	33	AFDEV		
479	NOR MZ	Chinyera School	1133D1	735230 RB85	1993	110 PVC	36.0	5.4	0.04	0.65	24	AFDEV		
480	NOR MZ	Gowoka D/Tank	1133B3	682288 RB86	1994	110 PVC	36.2	2.7	0.03	0.50	24	AFDEV		

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION
REG DIST LOCALITY MAP GRID BH YEAR CAS. DEPTH WATER SPEC MAX PUMP PUM. BACT. CHEM
SHEET REF NO REH SIZE TYPE OF BH. LEVEL CAP. YIELD DEPTH TYPE PROB PROB
NO.

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG DIST LOCALITY	MAP SHEET	GRID REF	BH NO	YEAR REH	CAS. SIZE mm	DEPTH m.b.s	WATER TYPE OF BH.	SPEC CAP. 1/sec/m	MAX YIELD 1/sec/m	PUMP DEPTH m	BACT TYPE	CHEM PROB	PROB
481 Nor MZ	Jombo, Vgr	1133B2	972679	RBS7	1993	110 PVC	45.9	1.1	0.04	1.11	30	AFDEV	Fe
482 Nor MZ	Vazala School	1233D1	725036	RK10	1992	110 PVC	47.0	10.4	0.04	0.50	33	AFDEV	*
483 Nor MZ	Mawaso Village	1133B3	547471	RK116	1994	110 (PVC)	44.1	6.3	0.12	1.00	27	AFDEV	*
484 Nor MZ	Mtwalo H/C.	1133B3	815410	RK15	1994	110 (PVC)	75.3	10.4	0.02	0.71	30	AFDEV	*
485 Nor MZ	Inkosi Mpherembi	1133B3	668518	RK16	1993	110 PVC	61.0	17.5	0.01	0.20	33	AFDEV	*
486 Nor MZ	Moses Kanyama	1133A4	461453	RK17	1993	110 PVC	60.1	4.2	0.02	0.31	30	AFDEV	*
487 Nor MZ	Mbalachanda RGC1133A3	540449	RK173	1993	110 PVC	45.5	10.4	0.04	0.80	33	AFDEV	*	
488 Nor MZ	Kamalambo	1233B3	599345	RK174	1992	110 PVC	45.1	8.9	0.22	3.00	33	AFDEV	NO3
489 Nor MZ	Lwakhozi	1133C2	513138	RK18	1993	110 PVC	61.7	8.2	0.04	1.50	33	AFDEV	*
490 Nor MZ	Mphongo School	1133D3	586878	RK189	1992	110 PVC	46.7	3.9	0.21	2.00	33	AFDEV	*
491 Nor MZ	Ching'anya Sch	1133D1	554166	RK19	1993	110 PVC	59.8	8.0	1.42	3.00	33	AFDEV	*
492 Nor MZ	Kamchocho	1133C2	446112	RK190	1993	110 PVC	44.9	9.4	0.28	1.00	33	AFDEV	*
493 Nor MZ	Bulala H.Centre	1133C2	498094	RK191	1992	110 PVC	60.6	10.2	0.02	1.00	33	AFDEV	*
494 Nor MZ	Yotamu Ziba	1133D1	622084	RK192	1993	110 PVC	46.8	2.1	0.08	1.00	15	AFDEV	*
495 Nor MZ	Luweya School	1133A4	455299	RK4	1993	110 PVC	59.5	5.7	0.81	3.00	33	AFDEV	*
496 Nor MZ	Milenje School	1233D1	663027	RK9	1992	110 PVC	47.7	10.8	0.01	0.50	30	AFDEV	Fe
497 Nor MZ	Euro School.	1133B1	6355634	RM1	1993	110 PVC	42.5	10.0	0.03	0.74	33	AFDEV	*
498 Nor MZ	Mbalachanda RGC1132A4	399441	SM400	1993	110 PVC	44.0	8.9	0.14	1.00	21	AFDEV	*	
499 Nor MZ	Jingi	1133C2	426136	SM532	1993	110 PVC	48.5	8.8	0.10	2.00	33	AFDEV	FC
500 Nor MZ	Batameyo Tembo	1233A2	449575	SM538	1992	110 PVC	45.0	10.0	0.08	2.00	33	AFDEV	*
501 Nor MZ	Scott Mhangano	1133B3	688334	W159	1993	110 PVC	45.9	14.6	0.02	0.50	33	AFDEV	*
502 Nor MZ	Champfhira Polici	1233B3	6622368	W192	1992	110 PVC	45.7	13.5	0.09	0.50	33	AFDEV	*
503 Nor MZ	Tombolombo	1133C4	514802	W212	1992	110 PVC	38.0	13.3	0.33	3.00	33	AFDEV	*
504 Nor MZ	Ephangweni	1233A2	502538	W214	1992	110 PVC	45.0	10.0	0.08	2.00	33	AFDEV	*
505 Nor MZ	Vibangalala Sch	1233A2	512493	W216	1992	110 PVC	55.0	10.8	0.10	2.00	33	AFDEV	*
506 Nor MZ	Wilson Jere	1233A2	368543	W218	1992	110 PVC	49.5	20.1	0.02	0.56	33	AFDEV	*
507 Nor MZ	Chibambo	1133B4	978406	W263	1993	110 PVC	49.5	20.1	0.02	0.56	33	AFDEV	*
508 Nor MZ	Doroba, Nyanjaghi	1133B2	850602	W264	1993	110 PVC	Abandoned due to low yield						
509 Nor MZ	Kalama School	1133B2	852651	W265	1993	110 (PVC)	36.3	6.1	0.17	1.18	21	AFDEV	*
510 Nor MZ	Yakobe Ndezu	1133A4	496485	W289	1994	110 (PVC)	Abandoned due to low yield						

BOREHOLES REHABILITATED UNDER CONTRACT 27/91 IN THE NORTHERN REGION

Kampsax International A/S
P.O.Box 1735, Lilongwe
Malawi

REG	DIST	LOCALITY	MAP SHEET NO.	GRID REF	BH NO.	YEAR REH	CAS. SIZE mm	DEPTH m.b.s	TYPE OF BH	WATER LEVEL	SPEC CAP. 1/sec/m	MAX YIELD 1/sec	PUMP CAP. m.b.s	BACT PROB	CHEM PROB
Abandoned due to Obstruction															
Abandoned due to Obstruction															
Abandoned due to Obstruction															
Abandoned due to Obstruction															
Abandoned due to Obstruction															
511	Nor MZ	Rufu Mkunika	1133D1	582171	W290	1993	110 PVC	36.0	6.3	0.07	0.50	27	AFDEV *	FS	
512	Nor MZ	Edingeni	1233A2	345687	W292	1993	110 PVC	54.8	11.2	0.07	3.00	33	AFDEV *		
513	Nor MZ	Dimi	1233A2	450556	W294	1992	110 PVC	46.8	8.8	0.08	1.50		AFDEV *		
514	Nor MZ	Thoza	1233B1	574645	W295	1992	110 PVC	33.0	6.4	0.03	0.75	27	AFDEV *		
515	Nor MZ	Mzoma School	1233A2	385567	W298	1992	110 PVC	41.3	22.7	0.20	2.00	24	AFDEV *	*	
516	Nor MZ	Mheraunda Sch	1233A2	517682	W299	1992	110 PVC	50.2	11.1	0.02	0.25	33	AFDEV *	FS	
517	Nor MZ	Magido Sch	1133D1	703104	W300	1993	110 PVC	29.3	8.5	0.11	2.00	27	AFDEV *	*	
518	Nor MZ	Vongo School	1133B2	864805	W79	1993	110 PVC	32.9	3.6	0.34	1.50	27	AFDEV *		
519	Nor MZ	Yotamu Ng'oma	1133C4	488823	W82	1992	110 PVC	32.2	8.4	0.09	1.33	24	AFDEV *	*	
520	Nor MZ	Chimutu	1233A2	484714	W83	1992	110 PVC	38.5	5.2	0.03	1.00	33	AFDEV *		
521	Nor MZ	Chisasa	1233C4	514006	W84	1993	110 PVC	39.0	10.2	0.08	1.00	24	AFDEV *		
522	Nor MZ	Kapando School	1133A4	533459	W85	1993	110 PVC	31.1	0.04	0.34	9	AFDEV *			
523	Nor MZ	Nthawaka	1233B3	617180	W88	1994	110 PVC	58.0	15.3	0.07	2.00	39	AFDEV *		
524	Nor MZ	Luwelizi	1233D1	712148	W89	1992	110 PVC	62.5	19.5	0.01	0.33	33	AFDEV *	Fe	
525	Nor MZ	Enkweleli Schooo	1334A3	458076	X104	1993	110 PVC	41.8	10.5	0.01	0.36	24	AFDEV *	*	
526	Nor MZ	Nzimema	1133B3	665476	X162	1993	110 PVC	39.0	10.2	0.08	1.00	24	AFDEV *	*	
527	Nor MZ	Rufukazi Gama	1133B3	684494	X163	1993	110 PVC	14.9	3.1	0.04	0.34	9	AFDEV *		
528	Nor MZ	Masawani	1133B1	673587	X164	1993	110 (PVC)	58.0	15.3	0.07	2.00	39	AFDEV *		
529	Nor MZ	Thomas Mkandawali	1133B1	550627	X165	1993	110 PVC	44.5	9.7	0.04	1.11	33	AFDEV *		
530	Nor MZ	Kajawa Nyirenda	1133B1	560640	X166	1993	110 PVC	50.0	19.4	0.06	0.71	27	AFDEV *		
531	Nor MZ	Genesis Mzima	1133A2	522599	X167	1993	110 PVC	50.0	19.4	0.06	0.71	27	AFDEV *		
532	Nor MZ	Saulos Mgemezu	1133B3	631528	X169	1993	110 PVC	50.0	18.5	0.01	0.33	33	AFDEV *	ES	*
533	Nor MZ	Simon Jere	1133A2	543599	X170	1993	110 PVC	42.6	8.6	0.04	1.18	30	AFDEV *		
534	Nor MZ	Mzimba Water	1133D3	655838	Z133	1993	110 (PVC)	57.2	4.0	0.003	0.15	33	AFDEV *	ES	*
535	Nor NB	Kavuzi School	1134C2	259243	CG35	1992	110 (PVC)	48.7	5.8	0.01	0.45	30	AFDEV *	*	
536	Nor NB	Luweya Forest	1134C3	302982	DP185	1992	110 PVC	85.4	8.7	0.01	0.45	33	AFDEV *	*	
537	Nor NB	Mpamba Agr	1134C1	306237	FM114	1992	110 PVC	21.6	1.8	0.04	0.65	18	AFDEV *	*	
538	Nor NB	Thanula School	1134A3	295354	GK192	1993	110 PVC	37.2	11.3	0.02	0.35	30	AFDEV *	*	
539	Nor NB	Kalambwe School	1134C1	403172	GK193	1992	110 PVC	61.5	10.1	0.07	1.10	33	AFDEV *	*	
540	Nor NB	New Maula	1134C1	339010	GK194	1993	110 PVC								

Table 10 List of Local Labor Wages by Category

Category	Qualification	Standard Wages (daily)	Allowance			Total Wages (Daily)
			Overtime Pay (hourly)	Holiday Pay (hourly, daily)	Others (hourly, daily)	
Engineer	University Level	K65.13		K1		
Assistant Engineer	High school Level	K49.43		K1		
Driller	more than 15 years experience	K64.03		K1		
Assistant Driller	more than 5 years experience	K33.40		K0.72		
Mechanic	more than 15 years experience	K33.40		K0.72		
Assistant Mechanic	more than 5 years experience	K20.90		K0.72		
Foreman	more than 15 years experience	K44.60		K0.72		
SK. & I Worker *		K33.40				
Licensed Driver (for Heavy Duty Cars)	must be licensed	K19.80 tp		K0.72		
Licensed Driver (for Light Vehicles)	must be licensed	K19.80 tp		K0.72		
Translator **		K33.40				
General Clerk		K26.10		K0.72		
Typist		K35.63		K0.72		
Security Officer		K29.66		K0.72		
Operative (Semi-skilled Worker)		K27.20		K0.72		

* concrete worker, carpenter, steel fixer, welder/fitter, bricklayer, plumber, mason, etc.

** Portuguese/English, Native Language/English

