RULE 5

ROLES OF NATIONAL GOVERNMENT AGENCIES

Article 13. Department of the Interior and Local Government (DILG). The DILG shall have the following responsibilities in the sector:

a. Raise awareness of LGUs on opportunities relating to the sector, within the framework of relevant government policies, such as financing schemes and available assistance from local and foreign financing institutions, technological breakthroughs, management and institutional arrangements, etc.;

b. Facilitate transactions between LGUs and communities and lending institutions by preparing water supply investment packages, assisting in the financial, economic and institutional and environmental data collection and analysis, etc., in coordination with appropriate national government agencies;

c. Build capacity of LGUs and BWSAs/RWSAs in the general areas of planning, implementation, management, monitoring and evaluation, and regulation, upon agreement with the LGUs, and as required by financing institutions, in coordination with national government agencies such as DPWH in the case of the engineering aspects;

d. Develop and maintain a national data management system of LGU-managed water systems to include data on extent of service coverage, cost recovery, collection efficiency, size of water systems, nature of water resources, among others, in coordination with appropriate national government agencies;

e. Establish a system for monitoring strategic performance of LGUs in relation to the sector, including compliance with technical standards established by LWUA and DPWH;

f. Upon agreement with the LGU, provide technical assistance in the establishment of a system of public performance audit, in collaboration with appropriate national government agencies;

g. Coordinate sector activities of LGUs vis-a-vis other national government documents and issue regular bulletins;

h. Monitor the implementation of this IRR, including the formulation of monitoring and evaluation parameters and reporting requirements; and

i. Act as the coordinator for projects funded by the National Government per NEDA Board Resolution No. 6 (series of 1996).

Article 14. Local Water Utilities Administration (LWUA). The LWUA shall have the following responsibilities in the sector:

a. Act as a specialized lending institution for local water districts;

b. Provide technical assistance to local water districts in the areas of operation, maintenance, personnel training and fiscal practices;

c. Upon agreement with the LGU, provide technical and financial assistance in the conduct of engineering studies;

d. Approve tariffs of local water districts;

e. Establish and update, as and when necessary, the technical standards for local water utilities, including LGU-managed systems;

f. Monitor and evaluate the performance of local water districts; and

g. Register RWSAs and furnish all registration documents to DILG.

Article 15. Department of Public Works and Highways (DPWH). The DPWH shall have the following responsibilities in the sector:

a. Set and/or update, as and when necessary, technical standards for engineering surveys, design, construction and operation and maintenance of Level I systems;

b. Upon agreement with the LGUs, assist in the conduct of engineering surveys and in the preparation of plans, specifications and programs of work, through its District Offices;

c. Upon agreement with the LGUs, assist in construction management, through its District Offices; and

d. Conduct technical researches in coordination with the LGUs.

Article 16. Department of Health (DOH). The DOH shall have the following responsibilities in the sector:

a. Set and/or update, as and when necessary, standards on water quality testing, treatment and surveillance, and sanitary practices;

b. Provide technical assistance to the LGUs in the conduct of periodic water quality control and surveillance-related activities; and

c. Monitor and evaluate, on a regular basis, health and hygiene education programs implemented by local health offices, particularly in areas where waterworks systems are expected to be constructed.

Article 17. National Water Resources Board (NWRB). The NWRB shall have the following responsibilities in the sector:

a. Regulate the use of water resources through the issuance of water rights;

b. Regulate tariffs of privately-run water system; and

c. Establish and manage a user-friendly water resources data management system.

Article 18. Metropolitan Waterworks and Sewerage System (MWSS). The MWSS shall be responsible for water systems in Metro Manila and its adjacent areas.

RULE 6
RURAL/BARANGAY WATERWORKS AND SANITATION ASSOCIATIONS

Article 19. General Provision. A Rural/Barangay Waterworks and Sanitation Association shall be formed to manage public water systems and sanitation facilities: RWSAs for Level II systems and BWSAs for Level I systems. RWSAs/BWSAs shall initiate/assist in site identification, planning, implementation and evaluation of water supply projects as well as guide the construction and/or maintenance of household and community latrines (toilets).

Article 20. Organization of RWSAs/BWSAs. RWSAs and BWSAs shall be organized upon initiation of the LGU. A participatory approach shall be adopted in the formation of RWSAs/BWSAs with the LGU concerned taking the lead and non-government organizations (NGOs) providing technical assistance, as necessary. Prior to the formation of RWSAs/BWSAs, dialogues shall be conducted with and among all stakeholders such as women's groups, civic and religious organization, health practitioners, NGOs and other people's organizations.

Article 21. Registration Requirements. RWSAs/BWSAs shall register with DILG. BWSAs shall be encouraged to associate with other BWSAs or the RWSAs prior to registration. DILG shall keep a record of all registration documents.

Article 22. Powers. Every duly registered RWSAs/BWSA shall be autonomous and shall have the power and capacity to:

a. Award and enter into a contract(s) with private contractors for the delivery of necessary services or the supply of materials, in the course of managing a public water and sanitation facility, subject to existing laws, rules and regulations;

b. Oversee the implementation of project undertaken by private contractors;

c. Own and manage the operation of the water facility in a sustainable manner, including providing for adequate reserves for maintenance and repair, setting appropriate levels of user fees, and implementing billing and collection schemes;

d. Handle the activities required of any lawful business transaction entered into by the Association;

e. Enter into agreement with other RWSAs/BWSAs for any merger or consolidation as may be proven advantageous to their operations;

f. Convene meetings of water users for the purpose of information dissemination, consultation, public hearing on water rates and other activities deemed important;

g. Initiate improvements in operations found to be advantageous and favorable to the communities concerned;

h. Decide on matters found to be advantageous and favorable to the communities concerned; and

i. Prepare an annual report on its operations.

Article 23. Capability Building of RWSAs/BWSAs. RWSAs and BWSAs may request assistance for capability building form LGUs and/or DILG, DPWH and other concerned agencies, through the LGUs.

RULE 7
PROJECT DEVELOPMENT AND IMPLEMENTATION

Article 24. Sector Planning. Planning and development of water supply investment shall be made within the framework of national policies, and shall implement specific targets in the provincial and city/municipal sector plans. These plans shall define the strategies, policies and approaches in sector development at different levels of government. A National Sector Plan for Water Supply, Sewerage and Sanitation shall be prepared, and updated, on a regular basis, by the National Economic and Development Authority (NEDA), in coordination with the concerned oversight water agencies, and shall provide the national policy framework. At the provincial level, the LGUs, through their respective Provincial Planning and Development Offices, shall prepare, and update, on an annual basis, the Provincial Water Supply, Sewerage and Sanitation Sector Plans. At the city/municipal level, a similar sector plan shall be prepared and updated, on an annual basis, by the LGUs, through their City/Municipal Planning and Development Offices. The respective Local Councils shall approve the provincial and city/municipal sector plans.

Article 25. Project Identification. On the basis of the provincial and city/municipal sector plans, water supply investments shall be identified and developed into a local investment program that includes an appropriate financing plan. The Local Council concerned shall approve the local investment program. The proposed investments shall then be developed according to a demand-driven approach that would allow beneficiaries to select from among cost-effective technical options and from among financing options. The LGUs may avail of technical assistance from the DILG in the preparation of this project package (Rule 5).

Water supply investment shall be developed to the principles of managing water services at the most appropriate level and providing services based on what local consumers want and are willing to pay for. This means that LGU systems shall be constructed on the basis of choosing among technical options that are affordable through the financial resources made available by users, communities and LGUs. The process of determining demand for a particular service delivery shall be concluded through a negotiated agreement between the LGU, water utility and the users, on how the costs will be shared at the town, barangay and household levels.

Article 26. Technical Aspects. Technically feasible options shall be developed, particularly for a Level II service level. These options may include varying levels of operation (in terms of operating hours), which may have substantial implications on capital and operating and maintenance costs. In addition, the operation and management (O&M) cost of a technical option is strongly influenced by the management mode chosen by an LGU, economies of scale factors and the size of the service area. Thus, for any Level III service, at least two technical options shall be explored; those of an inter-LGU service delivery organization involving amalgamation of service areas and of singled LGU management systems. The former option shall be explored and developed further only upon agreement with the LGU concerned.

In the conduct of the engineering work (i.e., feasibility studies and detailed design), the LGUs may tap the services of the private sector, using their internal resources or may request the DILG, DPWH and/or LWUA for financial and/or technical assistance.

Article 27. Financing and Management Options. A range of options is available to the LGUs on financing and management of Level III systems. They include, but are not limited to, the following options:

Options 1: The LGU may finance the system from its internal resources or may borrow from a financial institution. It may then create a **profit center within the LGU** office with a separate cost accounting system. Under this arrangement, the LGU may directly manage the system or may enter into a **management contract** with a private party or a **service contract** with a private party to handle billing and collection and/or repair and maintenance. In these types of management arrangements, the LGU retains the responsibility for providing the service and assumes the commercial risks. Institutions such as neighboring water districts, cooperatives and other private institutions may be tapped by the LGU for these types of contracts.

Option 2: The LGU may enter into a **lease contract** with private party to operate and manage the system. Under this arrangement, the LGU finances the capital expenditures from its internal resources or from borrowings. The LGU then leases the facility to a private party, which assumes the commercial risks and the responsibility for operation and maintenance. The private party is allowed to recover its costs from user fees, and may also collect, on behalf of the LGU, any other charges contributing to the repayment of a loan which the LGU may have taken on behalf of the users.

Option 3: The LGU may enter into **concession contract** with a private party. Under this arrangement, the private party assumes the operations and management of the assets of the LGU, and

undertakes to expand and finance the services according to the terms and conditions of the contract. The private party is then allowed to operate the system, and recover its costs and earn a reasonable return on its investment from user fees. The private party also assumes the commercial risk. After the concession contract expires, the system reverts to the LGU, or may be contracted out again by the LGU.

Option 4: The LGU may create a **local water district,** in accordance with Presidential Decree No. 198, as amended.

Option 5: The **LGU may form a water company** to handle the provision of the service.

The LGU appoints the Board of Directors to be tapped from the private sector who would manage the company along commercial principles.

Options 6: The LGU may enter into contract with a private party under the **Build-Operate-Transfer scheme or any of its variants,** per Republic Act No. 6970, as amended, for the whole water system or a component of it (i.e., source development or distribution).

Option 7: The LGU may enter into a **joint venture agreement** with a private party in providing the service. Under this arrangement, both parties share in the risks of the project, as well as operate the water supply system through a shared management and organization structure.

In the contracts of LGUs with private parties, performance standards shall be stipulated including remedies for non-performance that are consistent with national regulatory laws.

The DILG, in its role of raising awareness of LGUs on opportunities in the sector, shall be responsible for informing the LGUs of these schemes, and in facilitating the implementation of the preferred option. **Annex D** provides a matrix of these various schemes.

RULE 8
COORDINATION AND COLLABORATION MECHANISMS

Article 28. Inter-LGU Collaboration. Provinces, cities, municipalities and barangays may assist, coordinate and collaborate with each other, as far as practicable, in the effort of improving the delivery of services to the Filipino people. The DILG shall take the lead in coordinating among the LGUs.

Article 29. Coordination Between Local and National Governments. LGUs may avail of the technical, financial and institutional expertise of national agencies like LWUA, DPWH, DILG, NWRB, DOH and DENR. DILG, as appropriate, shall coordinate with other national agencies on behalf of the LGUs.

RULE 9
TRANSITION ARRANGEMENTS

Article 30. Ongoing Projects. The DPWH, DOH and DILG shall continue to implement ongoing foreign-assisted Level I projects until the completion of such projects.

Article 31. Pipeline Projects. Projects in the pipeline shall conform to the provisions of this IRR to the extent possible.

RULE 10
MISCELLANEOUS PROVISIONS

Article 32. Applicability Clause. The application of this IRR shall be without prejudice to existing and future laws, rules, regulations, and/or international agreements entered into by the Philippine Government.

Article 33. Effectivity of the IRR. These Implementing Rules and Regulations shall take effect upon its approval by the NEDA Board, on recommendation by the Infrastructure Committee. It shall then be published in at least two national newspapers of general circulation.

Annex A

NEDA Board Resolution No. 5 (series of 1998)

APPROVING THE IRR ONTHE DELINEATION OF RESPONSIBILITIES IN THE DEVELOPMENT AND IMPLENTATION OF WATER SUPPLY PROJECTS

On motion duly seconded,

BE IT RESOLVED, as it is hereby resolved, to approve as it is hereby approved, the Implementing Rules and Regulations (IRR) on the Delineation of Responsibilities in the Development and Implementation of Water Supply Projects.

UNANIMOUSLY APPROVED, 17 March 1998.

Annex B

NEDA Board Resolution No. 4 (series of 1994)

APPROVING THE RECOMMENDATION OF THE INFRASTRUCTURE COMMITTEE (INFRACOM) ON THE REFORMS IN THE WATER SUPPLY SECTOR

On motion duly seconded,

BE ITS RESOLVED, as it is hereby resolved, to approve and confirm, as the same is hereby approved and confirmed the following recommendations of the INFRACOM:

a. Registration with the National Water Resources Board (NWRB) of all drilling and the extraction of water therefrom, irrespective of the use of extracted water and ownership of the land where the well is to be drilled. Amendment to Article 6 of the Water Code (PD No. 1067) shall be initiated by NWRB to this effect. Subsequently, NWRB shall formulate rules and regulations for the effective enforcement of this requirement within sixty (60) days after approval of the proposed amendment.

b. Strengthening of the NWRB staff in order to effectively cope with the planning, monitoring and implementation activities of the water resources sector. NWRB shall submit an action plan to this effect to INFRACOM for review and endorsement to the President of the NEDA Board.

c. Reorientation of the Local Water Utilities Administration (LWUA) to its original corporate mission as a "specialized lending institution" financing only viable water supply projects with tariff levels formulated towards full cost recovery. LWUA shall therefore upgrade its banking and finance expertise and immediately complete its financial restructuring. Further, it should radically improve its collection efficiency as well as its database and accounting systems.

d. Privatization of all existing Water Districts (WDs) should be vigorously pursued whenever feasible and large commercially viable water services areas like Metro Manila, Cebu, Zamboanga, Davao should be formed or converted into SEC-style private water corporations, independent of LWUA and other government funding institutions by subject to regulation by NWRB.

e. Procurement needs of WDs should be provided based on a competitive basis and not centrally imposed.

f. LWUA shall submit an action plan to INFRACOM to effect the recommended reforms for review and endorsement.

g. With respect to the delineation of responsibilities in the sector, NEDA Board Resolution No. 5 (series of 1998) is proposed to be amended to allow local government units (LGUs) to implement all levels of water supply projects consistent with government's decentralization and devolution process, mandating LWUA to implement only financially viable projects and further defining the roles of the agencies in the sector. The proposed amendment is as follows:

"Level I (point source system), Level II (communal faucet) and Level III (house connections) water supply projects may be implemented by the concerned LGUs within their jurisdiction. LWUA shall implement only financially viable Level III water supply projects in areas outside the MWSS jurisdiction. DILG's participation will consist of general administration and institution building, such as assistance to the LGUs in the formation of Rural and/or Barangay Waterworks and Sanitation Associations (RWSAs/BWSAs) as well as in the identification of water supply systems. MWSS will be responsible for Level II water systems in Metro Manila and adjacent areas. DPWH, together with DILG and DOH, will provide technical assistance (within a period of about 2 years) to LGUs in the planning, implementation and operation and maintenance of water supply facilities".

UNANIMOUSLY APPROVED, 15 March 1994.

Annex C

NEDA Board Resolution No. 6 (series of 1996)

APPROVING THE RECOMMENDATIONS OF THE INFRASTRUCTURE COMMITTEE (INFRACOM) ON THE EXECUTING AGENCY ARRANGEMENT FOR THE DEVOLVED INFRASTRUCTURE ACTIVITIES/FACILITIES

On motion duly seconded,

BE IT RESOLVED as it is hereby resolved, to approve and confirm as the same is hereby approved and confirmed, the following recommendations of INFRACOM on national government (NG) assistance to Local Government Units (LGUs) in the implementation of devolved infrastructure activities/facilities under the Local Government Code in support of national priority programs in order to ensure efficiency, effectivity and more focused implementation consistent with the Government's decentralization and devolution objectives:

a. DILG, which has administrative supervision over LGUs, shall be the lead national government agency (NGA) to oversee/administer NG assistance to LGUs in the implementation of devolved infrastructure programs/projects with the collaboration/participation of other concerned agencies. The identification and formulation of infrastructure programs/projects devolved to LGUs proposed for NG assistance shall therefore be coordinated with DILG to rationalize their development;

b. The implementation of identified devolved infrastructure programs/projects shall be undertaken by the LGUs with DILG providing assistance in institution, capacity and capability building of the LGUs and with DPWH and other technical agencies providing and transferring technical expertise to the LGUs as necessary. The levels of capacities and capabilities of LGUs shall be determined by the DILG in coordination and collaboration with DPWH and other concerned agencies to determine, among others, the extent of support and assistance that these national agencies should provide in order to effect the successful implementation of devolved NG-assisted infrastructure programs/projects:

c. DILG, as the lead agency, shall include in its annual budget the financial requirements necessary for the implementation of the identified and approved devolved infrastructure programs/projects. This shall be without prejudice to any future funds arrangement that the national government may

adopt with regard to NG assistance to LGUs for devolved projects particularly funds source from foreign loans and grants;

d. For on-going and already committed devolved infrastructure programs/projects with NG assistance, the same shall be implemented with the previously identified NGA as lead in order not to disrupt is prosecution. However, there shall be phasing in at DILG and LGUs in the implementation arrangements for these devolved infrastructure projects in accordance with the provisions of this Resolution for purposes of policy and operational consistency and thus, effect a smooth transition;

e. To efficiency and effectively implement the provisions of this Resolution, the INFRACOM shall formulate and periodically review the guidelines, rules and regulations that will already define the specific roles of the various concerned agencies in the implementation of NG assistance to LGUs for devolved infrastructure activities/utilities as well as the appropriate implementing mechanisms. In addition, INFRACOM shall likewise formulate the criteria and program for phasing out NG assistance to LGUs for devolved infrastructure activities/facilities;

f. To carry out its tasks, the INFRACOM may request for financial and technical assistance form participating government agencies as well as from multilateral and bilateral sources; and

g. The provisions of this Resolution shall apply to all NG assistance for devolved infrastructure activities/utilities unless otherwise explicitly provided for under the existing and future laws, such as the General Appropriations Act (GAA).

UNANIMOUSLY APPROVED, 12 March 1996.

Annex D

MATRIX OF FINANCING AND MANAGEMENT OPTIONS

Option	Description
LGU-Financed and Managed	The LGU finances the investment from its income and other resources available to it (e.g., URA, locally-generated taxes, grants) or borrows from a financial institution. It then establishes a profit center within the LGU office with a separate cost accounting system. Under this arrangement, the LGU directly manages the operations of the system. The LGU assumes the commercial risk.
Service Contract	The LGU finances the investment and directly operates and manages the system. It enters into contract with a private party to undertake billing and collection and/or repair and maintenance activities for a fee. The LGU maintains a profit center within the LGU office and assumes the commercial risk.
Management Contract	The LGU finances the investment and enters into contract with a private party to manage the system. The private party collects the water tariffs set by the LGU, operates and manages the system and in turn, is paid a management fee by the LGU. The LGU maintains a profit center within the LGU office and assumes the commercial risk.
Lease Contract	The LGU finances the capital expenditures and leases the facility to the private sector. The private sector assumes the commercial risks and the responsibility for operation and maintenance. To recover its costs, the private party is allowed to collect user fees as well as any other charges on behalf of the LGU.
Concession Contract	The LGU enters into contract with a private party to undertake the investment. The private party assumes the assets of the LGU and undertakes to expand the services according to the terms and conditions of the contract. The private party is allowed to operate the system and to collect user fees to recover its costs and earn a reasonable return on its investment. After the contract expires, the system reverts to the LGU or may be contracted out again by the LGU.
Creation of a Local Water District	The LGU may create a local water district. The local water district finances the investment from a loan from the Local Water Utilities Administration (LWUA) and operates and manages the system. The local water district is then supervised by LWUA.
LGU Company	The LGU may form a water company to handle the provision of the service. The water company shall be duly

	registered with the Securities and Exchange Commission (SEC) and shall have share holdings which, can be sold to the private sector in the future. The LGU appoints the board members to be selected from the private sector who would then manage the company along commercial principles.
Build-Operate-Transfer or any of its variants (per RA 6970 as amended)	Under the BOT scheme, the private sector finances the investment, operates it for a certain period of time after which the asset is transferred to the LGU. The private party is allowed to collect user fees to recover its costs and earn a reasonable rate of return on its investment. The LGU and the BOT proponent negotiate on the risk sharing.
Joint Venture Agreement	Under a joint venture agreement, the LGU and the private party share in the risks of the project and operate the system through a shared management and organizational structure.

NEDA BOARD RESOLUTION
No. 5 (s. 1994)

APPROVING THE RECOMMENDATION OF THE INFRASTRUCTURE COMMITTEE (INFRACOM) ON THE NATIONAL POLICY, STRATEGY AND ACTION PLAN FOR URBAN SEWERAGE (LIQUID WASTE) AND SANITATION

On motion duly seconded,

BE IT RESOLVED, as it hereby resolved to approve as the same is hereby approved and confirmed the following recommendations of the INFRACOM:

A. NATIONAL POLICY

1. Provision of improved sewerage/sanitation services in urban areas shall be considered a high priority.
2. On-site sanitation facilities for all urban households/establishments readily adaptable to further sewerage systems shall be required.
3. All new subdivisions/housing developments shall provide simplified or conventional sewerage system/sanitation facilities.
4. Conventional or low-cost sewerage for central business districts and for potentially high-income residential areas where economically and financially viable shall be provided.
5. Treatment of industrial as well as collected city/municipality wastewater to established standards set forth by the DENR prior to disposal into the drainage system shall be required.
6. Provision of services shall be based on consumer demand and willingness to pay.

B. NATIONAL STRATEGY

1. A sanitation/sewerage program and a Central Sanitation/Sewerage program Support Office (CPSO) to coordinate subsector activities at the national level and to assist LGUs to plan and manage sanitation/sewerage programs at the community level shall be established.

2. External sources of assistance shall be explored provided as may be appropriate to enable Municipal Development Fund (MDF) facility or other financing sources to extend loans to LGUs for sanitation and sewerage projects.

3. LGUs shall primarily be the implementors of the sanitation/sewerage programs with the national government providing assistance to develop their capacities in the following areas: community participation, sub-sector planning, program management, regulation of development, selection of technologies, financial management, construction supervision, O&M, monitoring and reporting.

C. **ACTION PLAN**

1. A CPSO shall be created and housed at LWUA with the LWUA Board exercising over-all jurisdiction over its operations. An Inter-departmental Advisory Committee (IAC) composed of representatives from DPWH, DOH, DILG, DOF, DBM, LWUA, DENR, MWSS and NEDA shall likewise be created and act as the coordination body in the implementation and monitoring of urban sewerage and sanitation programs particularly the five (5) pilot areas (Davao City, Calamba, Dagupan City, Roxas City and Cotabato City). The representatives to the IAC shall preferably be Asst. Sec. or Dir. level. The Chairman of the IAC and the Dir. of the CPSO shall be appointed by the LWUA Board.

2. LWUA shall fully staff the CPSO from within its existing manpower as soon as possible. An international institutional development consultant shall be engaged to assist the CPSO to design and implement the activities. The CPSO shall exist for a period of about 3 to 5 years or until after its functions have been fully devolved to the LGUs.

UNANIMOUSLY APPROVED, 15 March 1994.

Certified true copy:

FORTUNATO R. ABRENILLA
Acting Board Secretary
and Director, Legal Staff

7. WATER SOURCE DEVELOPMENT

7.1 General

Table 7.1.1 Well Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)				Page: 1 of 5
Content: **Water Source - General Information**			Date:	
Data Collection Level: **Provincial**		Province No.: 1180	Filename: Water Source.xls	
Region Number: XI		Province Name: Sarangani		Form Number: P.4.1
	Type of Water Source		Shallow Well	Deep Well	Spring
	Total number of water sources	Number	4,152	500	136
Imple-mentor	Government Agency	Number	481	262	85
	Private	Number	3,671	238	51
Level	Level I	Number	4,152	484	85
	Level II	Number		7	49
	Level III	Number		9	2
Ownership	Water District	Number		6	2
	MEO/CEO	Number			
	RWSA	Number			
	BWSA	Number			
	Institution	Number		10	49
	Commercial Establishment	Number			
	Industrial/Agricultural Undertaking	Number			
	Public (Domestic)	Number	481	262	85
	Private (Domestic)	Number	3,671	222	
Abstraction	Submersible/Turbine	Number		16	
	Centrifugal	Number			
	Handpump	Number	4,152	484	
	Bucket & Rope	Number			
	Free Flowing	Number			
Usage	Drinking	Number	1,246	500	136
	Washing/Bathing	Number			
	Gardening/Irrigation	Number			
	Big-Scale Irrigation	Number			
	Production	Number			
Water Quality	No Quality Problem	Number			
	High Iron/Mag. Content	Number			
	High Chloride Content	Number			
	Turbidity/Colored/Smell	Number			
	Polluted/Contaminated	Number			
	Chlorinated	Number			
	Treated	Number			
Production	Seasonal Production	Number			
	Average Capacity < 100 m^3/day	Number	4,152	493	118
	Average Capacity >= 100 m^3/day	Number		7	18
	Number of Household < 5	Number			
	Number of Household >= 5	Number			

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 2 of 5	
Content: **Water Source - General Information**						Date:		
Data Collection Level: **Provincial**		Province No.: 1180				Filename: Water Source.xls		
Region Number: XI		Province Name: Sarangani				Form Number: P.4.1		
	Name of Municipalities	Character	Alabel			Glan		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	523	103	9	670	58	9
Imple-mentor	Government Agency	Number	91	59	8	132	17	1
	Private	Number	432	44	1	538	41	8
Level	Level I	Number	523	100	8	670	53	1
	Level II	Number			1			8
	Level III	Number		3			5	
Ownership	Water District	Number		1			5	
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number		2	1			8
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	91	59	8	132	17	1
	Private (Domestic)	Number	432	41		538	36	
Abstraction	Submersible/Turbine	Number		3			5	
	Centrifugal	Number						
	Handpump	Number	523	100		670	53	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	157	103	9	201	58	9
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m^3/day	Number	523	101	9	670	53	5
	Average Capacity >= 100 m^3/day	Number		2			5	4
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 3 of 5
Content: **Water Source - General Information**					Date:		
Data Collection Level: **Provincial**		Province No.: 1180			Filename: Water Source.xls		
Region Number: XI		Province Name: Sarangani			Form Number: P.4.1		
	Name of Municipalities	Character	Kiamba			Maasim		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	1,692	31	19	388	15	15
Imple-mentor	Government Agency	Number	94	18	10	46	13	5
	Private	Number	1,598	13	9	342	2	10
Level	Level I	Number	1,692	31	10	388	15	5
	Level II	Number			9			8
	Level III	Number						2
Ownership	Water District	Number						2
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number			9			8
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	94	18	10	46	13	5
	Private (Domestic)	Number	1,598	13		342	2	
Abstraction	Submersible/Turbine	Number						
	Centrifugal	Number						
	Handpump	Number	1,692	31		388	15	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	508	31	19	116	15	15
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m^3/day	Number	1,692	31	19	388	15	13
	Average Capacity >= 100 m^3/day	Number						2
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)								Page: 4 of 5
Content: **Water Source - General Information**						Date:		
Data Collection Level: **Provincial**		Province No.: 1180				Filename: Water Source.xls		
Region Number: XI		Province Name: Sarangani				Form Number: P.4.1		
	Name of Municipalities	Character	Maitum			Malapatan		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	330	170	30	317	68	7
Imple-mentor	Government Agency	Number	48	43	25	70	58	4
	Private	Number	282	127	5	247	10	3
Level	Level I	Number	330	170	25	317	61	4
	Level II	Number			5		6	3
	Level III	Number					1	
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number			5		7	3
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	48	43	25	70	58	4
	Private (Domestic)	Number	282	127		247	3	
Abstraction	Submersible/Turbine	Number					7	
	Centrifugal	Number						
	Handpump	Number	330	170		317	61	
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	99	170	30	95	68	7
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m^3/day	Number	330	170	29	317	68	7
	Average Capacity >= 100 m^3/day	Number			1			
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.1 Water Sources Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)								Page: 5 of 5
Content: **Water Source - General Information**						Date:		
Data Collection Level: **Provincial**		Province No.: 1180				Filename: Water Source.xls		
Region Number: XI		Province Name: Sarangani				Form Number: P.4.1		
	Name of Municipalities	Character	Malungon					
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	232	55	47			
Implementor	Government Agency	Number		54	32			
	Private	Number	232	1	15			
Level	Level I	Number	232	54	32			
	Level II	Number		1	15			
	Level III	Number						
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number						
	Institution	Number		1	15			
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number		54	32			
	Private (Domestic)	Number	232					
Abstraction	Submersible/Turbine	Number		1				
	Centrifugal	Number						
	Handpump	Number	232	54				
	Bucket & Rope	Number						
	Free Flowing	Number						
Usage	Drinking	Number	70	55	47			
	Washing/Bathing	Number						
	Gardening/Irrigation	Number						
	Big-Scale Irrigation	Number						
	Production	Number						
Water Quality	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number						
	Treated	Number						
Production	Seasonal Production	Number						
	Average Capacity < 100 m^3/day	Number	232	55	36			
	Average Capacity >= 100 m^3/day	Number			11			
	Number of Household < 5	Number						
	Number of Household >= 5	Number						

Table 7.1.2 Major References

Report/Information	Agency/Author	Contents	Reference Data/Description	Output
1. Topographic Map (1:250,000)	NAMRIA	political boundary, topographic contour, river, road, etc.	major river basins & road	Location Map (Base Map of the Province)
2. Rapid Assessment of Water Supply Sources	NWRB	groundwater availability, well inventory	well depth, static water level, specific capacity, etc.	Groundwater Availability Map
3. Individual Well Information Database	NWRB	location & well inventory	location with well depths & water levels	Individual Well Location Map
4. Groundwater Resources Investigation	NWRB	groundwater potential	high yielding and water quality problem areas	Groundwater Availability Map
5. Geological Map of the Philippines	BMGS	lithologic distribution and structures	aquifers distribution	Groundwater Availability Map
6. Philippine Water Resources Summary Data	NWRB	location map & runoff records	runoff record & statistical data	River Flow Duration Curve & Probability of Surface Water
7. Road Network Map of the Province	PPDC	major road & municipality boundaries	municipal boundaries	Distribution Map of Urban & Rural Areas
8. Feasibility Study Reports of the Water Districts	LWUA	well field information	groundwater potential & quality	Groundwater Availability Map
9. Water Quality Analysis Result	Water Districts	water quality results	water sources quality	Groundwater Availability Map & Groundwater Quality
10. Water Quality Analysis Result	PHO, PSPT	water quality results	water sources quality	Groundwater Availability Map & Water Sources Quality
11. Assessment of the Mineral Production	DENR	location, activity of the mining sites	location & activity of the mining sites	River Network Map
12. General Information of Groundwater	DEO, PSPT	groundwater availability	low yielding and water quality problem area	Groundwater Availability Map
13. Well Inventory	DEO, PSPT	location and well information	well depth, static water level, specific capacity, etc.	Existing Well Inventory
14. Spring Inventory	DEO, PSPT	location and spring information	discharge, distance & elevation	Water Sources Information
15. Pumping Test Data	DEO	pumping test results	well capacity	Groundwater Availability Map

7.3 Groundwater Sources

7.3.1 Classification of Groundwater Availability

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spc. Cap. (lpsm)
ALABEL	Alegria	Level I	SW	12.0	6.0	
ALABEL	Alegria	Level I	DW	42.0	6.0	
ALABEL	Bagacay	Level II	DW	48.0	40.0	0.1
ALABEL	Baluntay	Level I	SW	6.0	4.0	
ALABEL	Baluntay	Level I	DW	36.0	4.0	
ALABEL	Domolok	Level I	SW	15.0	13.0	
ALABEL	Domolok	Level I	DW	48.0	13.0	
ALABEL	Kawas	Level I	SW	9.0	7.0	
ALABEL	Kawas	Level I	DW	42.0	7.0	
ALABEL	Maribulan	Level I	SW	6.0	4.0	
ALABEL	Maribulan	Level I	DW	36.0	4.0	
ALABEL	Pag-Asa	Level I	SW	9.0	8.0	
ALABEL	Pag-Asa	Level I	DW	42.0	8.0	
ALABEL	Pob. Alabel	Level I	SW	9.0	8.0	
ALABEL	Pob. Alabel	Level III	DW	48.0	8.0	0.8
ALABEL	Spring	Level I	SW	15.0	12.0	
ALABEL	Spring	Level I	DW	48.0	12.0	
ALABEL	Tokawal	Level I	SW	15.0	12.0	
ALABEL	Tokawal	Level I	DW	48.0	12.0	
GLAN	Baliton	Level I	SW	6.0	4.0	
GLAN	Baliton	Level I	DW	36.0	4.0	
GLAN	Batotuling	Level I	SW	9.0	7.0	
GLAN	Batulaki	Level I	SW	9.0	8.0	
GLAN	Batulaki	Level I	DW	42.0	8.0	
GLAN	Big Margus	Level I	SW	9.0	6.0	
GLAN	Big Margus	Level I	DW	36.0	6.0	
GLAN	Burias	Level I	SW	12.0	10.0	
GLAN	Cablalan	Level I	SW	15.0	12.0	
GLAN	Cablalan	Level I	DW	42.0	12.0	
GLAN	Calabanit	Level I	SW	6.0	5.0	
GLAN	Calabanit	Level I	DW	36.0	5.0	
GLAN	Calpidong	Level I	SW	12.0	10.0	
GLAN	Congan	Level I	SW	9.0	7.0	
GLAN	Congan	Level I	DW	36.0	7.0	
GLAN	Cross	Level I	SW	9.0	7.0	
GLAN	Datalbukay	Level I	SW	6.0	5.0	
GLAN	Datalbukay	Level I	DW	36.0	5.0	
GLAN	E. Alegado	Level I	SW	12.0	10.0	
GLAN	E. Alegado	Level I	DW	42.0	10.0	
GLAN	Glan Padidu	Level I	SW	6.0	4.0	
GLAN	Glan Padidu	Level I	DW	36.0	4.0	
GLAN	Gumasa	Level I	SW	6.0	4.0	
GLAN	Gumasa	Level I	DW	42.0	4.0	
GLAN	Ilaya	Level I	SW	6.0	4.5	
GLAN	Ilaya	Level I	DW	36.0	4.5	
GLAN	Kaltuad	Level I	SW	9.0	8.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
GLAN	Kapatan	Level I	SW	6.0	4.0	
GLAN	Kapatan	Level I	DW	36.0	4.0	
GLAN	Lago	Level I	SW	9.0	8.0	
GLAN	Laguimit	Level I	SW	12.0	11.0	
GLAN	Mudan	Level I	SW	12.0	10.0	
GLAN	Mudan	Level I	DW	36.0	10.0	
GLAN	Pangyan	Level I	SW	6.0	5.0	
GLAN	Pangyan	Level I	DW	36.0	5.0	
GLAN	Poblacion	Level I	SW	9.0	8.0	
GLAN	Poblacion	Level II	DW	42.0	10.0	3.9
GLAN	Rio Del Pilar	Level I	SW	12.0	11.0	
GLAN	San Jose	Level I	SW	9.0	8.0	
GLAN	San Jose	Level I	DW	42.0	8.0	
GLAN	San Vicente	Level I	SW	8.0	6.0	
GLAN	San Vicente	Level I	DW	42.0	6.0	
GLAN	Small Margus	Level I	SW	9.0	8.0	
GLAN	Small Margus	Level II	DW	42.0	8.0	0.2
GLAN	Taluya	Level I	SW	12.0	11.0	
GLAN	Taluya	Level I	DW	42.0	11.0	
GLAN	Tango	Level I	SW	6.0	5.0	
GLAN	Tango	Level I	DW	36.0	5.0	
GLAN	Tapon	Level I	SW	9.0	8.0	
GLAN	Tapon	Level I	DW	36.0	8.0	
KIAMBA	Badtasan	Level I	SW	9.0	5.0	
KIAMBA	Badtasan	Level I	DW	42.0	5.0	
KIAMBA	Datu Dani	Level I	SW	18.0	5.0	
KIAMBA	Datu Dani	Level I	DW	48.0	5.0	
KIAMBA	Gasi	Level I	SW	18.0	5.0	
KIAMBA	Kapate	Level I	SW	18.0	5.0	
KIAMBA	Kapate	Level I	DW	48.0	5.0	
KIAMBA	Katubao	Level I	SW	18.0	5.0	
KIAMBA	Katubao	Level I	DW	48.0	5.0	
KIAMBA	Kayupo	Level I	SW	16.0	5.0	
KIAMBA	Kayupo	Level I	DW	48.0	5.0	
KIAMBA	Kling	Level I	SW	12.0	4.0	
KIAMBA	Kling	Level I	DW	42.0	4.0	
KIAMBA	Lagundi	Level I	SW	9.0	4.0	
KIAMBA	Lagundi	Level I	DW	42.0	4.0	
KIAMBA	Lebe	Level I	SW	12.0	4.5	
KIAMBA	Lebe	Level I	DW	42.0	4.5	
KIAMBA	Lomuyon	Level I	SW	12.0	5.0	
KIAMBA	Lomuyon	Level I	SW	4.0	0.0	
KIAMBA	Luma	Level I	SW	18.0	5.0	
KIAMBA	Luma	Level I	DW	48.0	5.0	
KIAMBA	Maligang	Level I	DW	48.0	6.0	
KIAMBA	Nalus	Level I	SW	18.0	5.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
KIAMBA	Nalus	Level I	DW	48.0	5.0	
KIAMBA	Poblacion	Level I	SW	12.0	5.0	
KIAMBA	Salakit	Level I	SW	9.0	5.0	
KIAMBA	Salakit	Level I	DW	48.0	5.0	
KIAMBA	Suli	Level I	SW	18.0	5.0	
KIAMBA	Suli	Level I	DW	48.0	5.0	
KIAMBA	Tablao	Level I	DW	48.0	5.0	
KIAMBA	Tamadang	Level I	SW	18.0	6.0	
KIAMBA	Tambilil	Level I	SW	9.0	5.0	
KIAMBA	Tambilil	Level II	DW	48.0	5.0	0.1
MAASIM	Bales	Level I	DW	48.0	6.0	
MAASIM	Colon	Level I	SW	18.0	5.0	
MAASIM	Colon	Level I	DW	42.0	5.0	
MAASIM	Daliao	Level I	SW	18.0	5.0	
MAASIM	Daliao	Level I	DW	42.0	5.0	
MAASIM	Kabatiol	Level I	SW	18.0	5.0	
MAASIM	Kablacan	Level I	SW	18.0	5.0	
MAASIM	Kablacan	Level I	DW	48.0	5.0	
MAASIM	Kamanga	Level I	SW	18.0	6.0	
MAASIM	Kamanga	Level I	DW	48.0	6.0	
MAASIM	Kanalo	Level I	SW	18.0	5.0	
MAASIM	Kanalo	Level I	DW	48.0	5.0	
MAASIM	Lumasal	Level I	SW	18.0	5.0	
MAASIM	Lumasal	Level I	DW	48.0	5.0	
MAASIM	Lumatil	Level I	SW	18.0	4.0	
MAASIM	Lumatil	Level I	DW	48.0	4.0	
MAASIM	Malbang	Level I	SW	18.0	5.0	
MAASIM	Pananag	Level I	SW	18.0	5.0	
MAASIM	Pananag	Level I	DW	48.0	5.0	
MAASIM	Pob. Maasim	Level I	SW	18.0	5.0	
MAASIM	Pob. Maasim	Level I	DW	48.0	5.0	
MAASIM	Seven Hills	Level I	DW	48.0	8.0	
MAITUM	Kalaneg	Level I	DW	54.0	7.0	
MAITUM	Kalaong	Level I	DW	24.0	8.0	
MAITUM	Kiambing	Level I	SW	18.0	5.0	
MAITUM	Kiambing	Level I	DW	48.0	5.0	
MAITUM	Kiayap	Level I	DW	54.0	5.0	
MAITUM	Mabay	Level I	SW	18.0	5.0	
MAITUM	Mabay	Level I	DW	48.0	5.0	
MAITUM	Maguling	Level I	SW	18.0	5.0	
MAITUM	Maguling	Level I	DW	48.0	5.0	
MAITUM	Mindupok	Level I	SW	18.0	6.0	
MAITUM	Mindupok	Level I	DW	48.0	6.0	
MAITUM	New La Union	Level I	DW	54.0	6.0	
MAITUM	Old Poblacion	Level I	SW	18.0	5.0	
MAITUM	Old Poblacion	Level I	DW	48.0	5.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
MAITUM	Pangi	Level I	SW	18.0	5.0	
MAITUM	Pangi	Level I	DW	48.0	5.0	
MAITUM	Pinol	Level I	SW	18.0	5.0	
MAITUM	Pinol	Level I	DW	48.0	5.0	
MAITUM	Pob. Malalag	Level I	SW	18.0	5.0	
MAITUM	Pob. Malalag	Level I	DW	48.0	5.0	
MAITUM	Sison	Level I	SW	18.0	5.0	
MAITUM	Sison	Level I	DW	48.0	5.0	
MAITUM	Ticulab	Level I	DW	48.0	8.0	
MAITUM	Upo	Level I	DW	24.0	7.0	
MAITUM	Wali	Level I	DW	24.0	8.0	
MAITUM	Zion	Level I	DW	24.0	6.0	
MALAPATAN	Daan Suyan	Level I	SW	9.0	4.0	
MALAPATAN	Daan Suyan	Level I	DW	42.0	8.0	
MALAPATAN	Kihan	Level I	SW	12.0	11.0	
MALAPATAN	Kihan	Level I	DW	42.0	11.0	
MALAPATAN	Kinam	Level I	SW	9.0	4.0	
MALAPATAN	Kinam	Level I	DW	42.0	8.0	
MALAPATAN	Libi	Level I	DW	36.0	8.0	
MALAPATAN	Lun Masla	Level II	DW	42.0	38.0	0.2
MALAPATAN	Patag	Level I	SW	9.0	8.0	
MALAPATAN	Patag	Level I	DW	42.0	8.0	
MALAPATAN	Sapu Masla	Level I	SW	15.0	13.0	
MALAPATAN	Sapu Masla	Level II	DW	42.0	13.0	0.1
MALAPATAN	Sapu Padidu	Level II	DW	42.0	38.0	0.1
MALAPATAN	Tuyan	Level II	DW	42.0	38.0	
MALAPATAN	Upper Suyan	Level I	SW	6.0	4.0	
MALUNGON	Alkikan	Level I	SW	12.0	6.0	
MALUNGON	Ampon	Level I	SW	9.0	5.0	
MALUNGON	Ampon	Level II	DW	42.0	8.0	0.2
MALUNGON	Atlae	Level I	SW	9.0	5.0	
MALUNGON	Atlae	Level I	DW	36.0	6.0	
MALUNGON	Banahaw	Level I	SW	12.0	6.0	
MALUNGON	Banahaw	Level I	DW	42.0	8.0	
MALUNGON	Banate	Level I	SW	12.0	6.0	
MALUNGON	Banate	Level I	DW	42.0	8.0	
MALUNGON	Datal Tampal	Level I	SW	12.0	5.0	
MALUNGON	Datal Tampal	Level I	DW	42.0	8.0	
MALUNGON	Kawayan	Level I	SW	12.0	6.0	
MALUNGON	Kawayan	Level I	DW	42.0	8.0	
MALUNGON	Kiblat	Level I	DW	42.0	8.0	
MALUNGON	Kinabalan	Level I	SW	12.0	6.0	
MALUNGON	Lower Mainit	Level I	SW	12.0	5.0	
MALUNGON	Lower Mainit	Level I	DW	36.0	8.0	
MALUNGON	Malalag Cogon	Level I	SW	9.0	5.0	
MALUNGON	Malalag Cogon	Level I	DW	36.0	8.0	

Table 7.3.1 Well Inventory by Municipality

Municipality	Barangay	Utilization	Type	Depth (m)	SWL (mbgs)	Spe. Cap. (lpsm)
MALUNGON	Malandag	Level I	SW	9.0	5.0	
MALUNGON	Malandag	Level I	DW	36.0	6.0	
MALUNGON	Nagpan	Level I	SW	12.0	6.0	
MALUNGON	Nagpan	Level I	DW	42.0	8.0	
MALUNGON	Panamin	Level I	SW	12.0	6.0	
MALUNGON	Panamin	Level I	DW	42.0	8.0	
MALUNGON	Poblacion	Level I	SW	12.0	6.0	
MALUNGON	Poblacion	Level I	DW	42.0	8.0	
MALUNGON	San Miguel	Level I	DW	42.0	8.0	
MALUNGON	San Roque	Level I	SW	12.0	5.0	
MALUNGON	San Roque	Level I	DW	42.0	8.0	
MALUNGON	Talus	Level I	SW	9.0	5.0	
MALUNGON	Talus	Level I	DW	36.0	7.0	
MALUNGON	Tamban	Level I	SW	12.0	6.0	
MALUNGON	Tamban	Level I	DW	42.0	8.0	

Table 7.3. 2 Groundwater Quality

No.	Municipality	Type	Bacterio.		Physical Analysis						Chemical Analysis				Major Cations				Major Anions				Trace Ele.	
			Coli. Cnt.	Bact. Cnt.	T C	NTU -	TCU -	Odor -	TDS mg/l	EC mmpc	pH -	TH mg/l	Alka. mg/l	Acid. mg/l	Na mg/l	K mg/l	Ca mg/l	Mg mg/l	CO3 mg/l	HCO3 mg/l	Cl mg/l	SO4 mg/l	Fe mg/l	Mn mg/l
Philippine National Standard for Drinking Water -1994-			0	0	-	5>	5>	unobj.	500>	-	6.5 to 8.5	300>	-	-	-	200>	-	-	-	-	200>	250>	1>	0.5>
1	Alabel	DW					5	unobj									110	66			112	2510	0.1	7.5
2	Alabel	SP					5	unobj									65	86			106	1230	0.2	7.4
3	Alabel	DW					5	unobj									48	82			32	860	0.1	7.5
4	Alabel	DW					5	unobj									94	102			84	1680	0.1	7.3
5	Alabel	DW					5	unobj									54	26			44	640	0.2	6.8
6	Glan	DW	50			1	19				7.2												0.3	0.1
7	Glan	SP	30			1	15				7.5												0.3	0.0
8	Glan	SW	TNTC			8	97				7.1												0.4	0.3
9	Kiamba	DW	-			0	0				7.6												0.1	0.1
10	Kiamba	DW	-			0	0				7.6												0.1	0.1
11	Kiamba	SP	TNTC			0	33				6.9												0.1	0.0
12	Kiamba	SW	10			1	118				7.3												0.2	0.2
13	Maasim	DW	-			2	63				7.4												0.4	0.3
14	Maasim	SP	10			0	6				7.2												0.1	0.0
15	Maasim	SW	TNTC			1	30				7.8												0.2	0.2
16	Maitum	DW	-			4	42				7.5												0.3	0.2
17	Maitum	SP	TNTC			1	9				7.4												0.2	0.1
18	Maitum	SW	50			2	56				6.5												0.4	0.1
19	Malapatan	DW	10			1	9				7.6												0.3	0.1
20	Malapatan	SW	50			0	4				7.5												0.3	0.1
21	Malungon	DW	-			0	112				8.5												0.1	0.1
22	Malungon	SP	-			1	27				7.4												0.1	0.1
23	Malungon	SW	50			5	104				7.2												0.4	0.3

Source; Water quality results were collected from respective Water Districts or analyzed by PSPT on site in the field survey using procured instruments.

Notes; Sampling point is located at handpump (L-I) or submersible pump (L-II/III).

Table 7.5.1 Surface Water Quality

Surface Water Information				Parameter												PNSDW.1994-			Surface Water Pollutants
Major River Water	Systems & Main	Sampling Location	Date (m/d/y)	Color TCU	pH -	D.Oxy. mg/l	BOD mg/l	SS mg/l	TDS mg/l	MBAS mg/l	O/G mg/l	N mg/l	P mg/l	Coli. MPN/100ml	Cl mg/l	Cu mg/l	Tur. NTU	Fe mg/l	Mn mg/l	
DENR			Class AA	15	6.5-8.5	70	1	25	500	nil	nil	1	nil	50	250	1	5>	1>	0.5>	in upstream
Water Quality Criteria for Fresh Water			Class A	50	6.5-8.5	70	5	50	1,000	0.2	1	10	0.1	1,000	250	1				
Glan		Glan		182	8.5	-	-	-	-	-	-	-	-	TNTC	-	-	32.9	0.4	0.3	
Lun Padidu		Alabel		246	8.5	-	-	-	-	-	-	-	-	TNTC	-	-	143.0	0.4	0.3	
Buayan		Malungon		90	8.5	-	-	-	-	-	-	-	-	TNTC	-	-	10.5	0.4	0.1	
		Alabel		137	8.5	-	-	-	-	-	-	-	-	300	-	-	20.0	0.4	0.2	
Siguel		Kiamba				-	-	-	-	-	-	-	-		-	-				
		Maasim		81	8.5	-	-	-	-	-	-	-	-	TNTC	-	-	9.5	0.2	0.1	
Kalaong		Maitum		48	8.0	-	-	-	-	-	-	-	-	TNTC	-	-	4.1	0.3	0.1	

Source; Water quality results were collected from respective Water Districts or analyzed by PSPT on site in the field survey using procured instruments.

Notes; Sampling point is located at upstream boundary of each river in respective municipalities.
If several streams are present in an area, the stream nearest from populated area was selected.
If these is no upstream, sampling point was selected near populated area.

Remarks; Class AA - Public Water Supply Class-I.
Intended for waters having watersheds which are uninhabited and otherwise protected and which require only approved disinfection in order to meet the PNSDW.

Class A - Public Water Supply Class-II.
Sources of water supply that will require complete treatment (coagulation, sedimentation, filtration & disinfection) in order to meet the PNSDW.

7.6 Future Development Potential of Water Sources

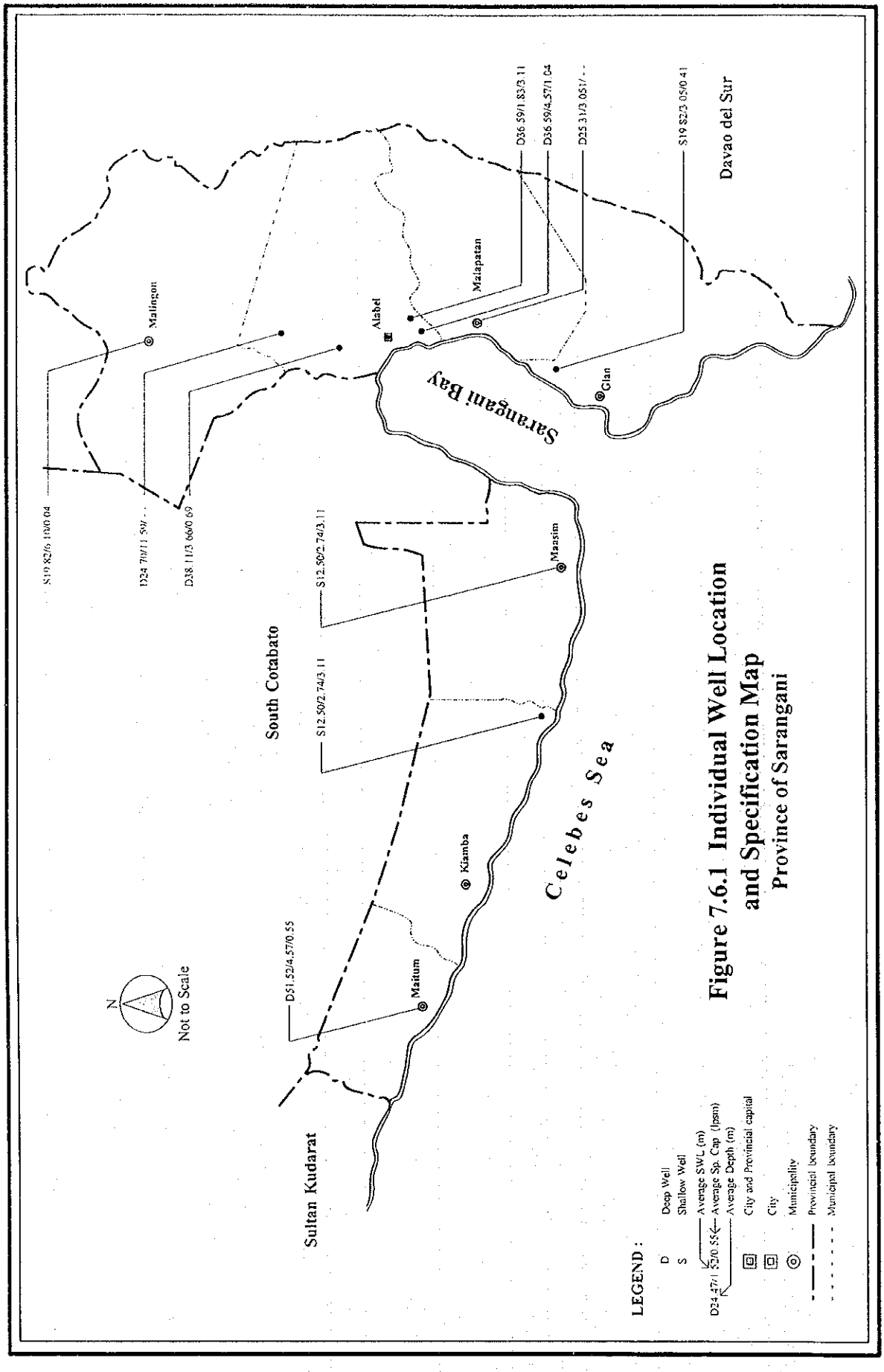

Figure 7.6.1 Individual Well Location and Specification Map
Province of Sarangani