

## **5. EXISTING SECTOR ARRANGEMENT AND INSTITUTIONAL CAPACITY**

### **5.2 Sector Reforms**

#### **A. IMPLEMENTATING RULES AND REGULATIONS**

#### **IMPLEMENTATING RULES AND REGULATIONS OF NEDA BOARD RESOLUTION NO.4 (SERIES OF 1994), CLAUSE (G)**

#### **PREFACE**

The following Implementing Rules and Regulations (IRR) of Clause (g) of NEDA Board Resolution No. 4 (series of 1994) was prepared with assistance from the World Bank, upon request of the Philippine Government, through the Department of the Interior and Local Government (DILG). It is an update of the earlier draft prepared in August 1995 and incorporates the developments that have occurred in the sector since that time. The intention is to provide a comprehensive and consistent set of IRR that reflects evolving policies in the sector to address basic service deficits. In particular, it attempts to translate the global sectoral principles of managing water as an economic good and managing services at the most appropriate level, into rules and regulations that can be understood and implemented by the local government units. This IRR reflects the following policies currently being developed by the Government:

- a. Encouraging LWUA lending rates to local water districts to be aligned to market rates;
- b. Providing national government grants for source development of Level I systems in support of a national objective of poverty alleviation;
- c. Developing a national sector plan that will provide the basis for provinces and cities/municipalities to plan and implement water and sanitation investments based on what communities want and are willing to pay for;
- d. Instituting a framework for economic regulation of the water supply and sanitation sector and defining the role of the LGU in this framework; and
- e. Instituting a system of public performance audit of public and private water utilities, so that consumers feedback on service coverage and reliability is available at the national and local levels of Government.

A major development was the creation of the Presidential Task Force on Water Resources Development and Management in October 1996, which has the objective of streamlining the regulatory environment of the sector, that is, linking resource regulation with the economic regulation aspects. A proposed bill prepared by the Task Force has been filed with Congress in July 1997 for the creation of a Water Resources Authority of the Philippines (WRAP) to undertake these regulatory functions, among others. Once this is approved by Congress and passed into law, the IRR may have to be revised to reflect the major institutional changes, particularly with regard to the roles of national government agencies in the sector.

## RULE 1 PURPOSE AND OBJECTIVES

**Article 1. Title.** These rules shall be known as the Implementing Rules and Regulations of clause (g) of NEDA Board Resolution No. 4, (series of 1994).

**Article 2. Purpose.** The purpose of these rules and regulations is to implement clause (g) of NEDA Board Resolution No. 4, (series of 1994), and is in support of NEDA Board Resolution No. 6, (series of 1996) which defines the executing agency arrangement for devolved infrastructure activities/facilities, including water supply, where national government assistance is provided. Clause (g) of NEDA Board Resolution No. 4 (series of 1994) states that:

*"Level I (point source system), Level II (command 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 LGUs in the formation of Rural and/or Barangay Waterworks and Sanitation Associations (RWVSAs/BVSAs) as well as in the identification of water supply systems. MWSS will be responsible for Level III water systems in Metro Manila and adjacent areas. DPWH, together with DILG and DOH, will provide technical assistance (within a period of about two years) to LGUs in the planning, implementation, and operation and maintenance of water supply facilities."*

Annex C presents NEDA Board Resolution No. 6, (series of 1996).

**Article 3. Objectives.** The objectives of the Implementing Rules and Regulations are as follows:

- a. To definite the role of local government units (LGUs) in the provision of water supply services and the assistance to be made available to them by national government agencies concerned;

- b. To provide guidance to the LGUs in the development and implementation of viable and sustainable water supply projects, to the extent feasible, supporting the principles espoused by the sector of managing water as an economic good, promoting a demand-oriented approach in the provision of services and management to be made at the most appropriate level, and greater private sector participation in service delivery; and
- c. To identify institutional strengthening needs of LGUs to further develop their capacity to adequately perform their agreed functions in the sector.

## **RULE 2**

### **SCOPE**

**Article 4. Scope.** These Implementing Rules and Regulations shall apply to water supply projects to be implemented and managed by LGUs where national government assistance is provided.

## **RULE 3**

### **DEFINITION OF TERMS**

**Article 5. Definition of Terms.** For purpose of these Implementing Rules and Regulations, the following terms shall be construed to mean as follows:

- a. **Levels of Service.** Based on NEDA Board Resolution No. 12 (series of 1995), approving the common definition of terms relative to water supply, sewerage and on-site sanitation, levels of service are defined as follows:

**Level I (Point Source)** – a protected well or a developed spring with an outlet but without a distribution system; generally adaptable for rural areas where the houses are thinly scattered. A Level I facility normally serves an average of 15 households.

**Level II (Communal Faucet System or Standposts)** – a system composed of a source, a reservoir, a piped distribution network, and communal faucets. Usually, one faucet serves four to six households. It is generally suited for rural and urban fringe areas where houses are clustered densely to justify a simple piped system.

**Level III (Waterworks System or Individual House Connections)** -- a system with a source, a reservoir, a piped distribution network and household taps. It is generally suited for densely populated urban areas.

- b. A **financially viable water supply system** refers to a system wherein its revenues can cover for all costs related to capital and operation and maintenance, including providing for reasonable reserves for future expansion. For those systems managed by water districts, a financially viable system is one that is able to generate revenues directly from user payments sufficient to cover all costs<sup>1</sup>. For LGU-managed directly systems, capital and operations and maintenance costs shall be recovered through a combination of user fees, general municipal taxes and other incomes available to the LGUs.

#### **RULE 4**

#### **ROLE OF LOCAL GOVERNMENT UNITS**

**Article 6. General.** The Local Government Code of 1991 mandates the decentralization and devolution of authority to LGUs in providing for certain basic services, which include safe potable water. At the local level, the LGUs are responsible for providing reliable water supply to their constituents, whether these are in the form of Levels I, II or III systems, depending on the expressed demand by the community for these services. LGUs may both directly provide and finance these services, or involve the private sector to participate in both provision and financing through concession, management or service contracts.

**Article 7. Financing and Cost Recovery.** In financing water supply investments, the LGUs may tap their Internal Revenue Allotment and/or locally generated revenues, or leverage these resources to borrow from government and private financial institutions. The amount that an LGU can borrow, including the required equity, is dependent on its current and expected revenue performance, as well as the amount of user charges and equity contributions from the community. The amount shall be a local decision of the LGUs concerned.

For any national government grant that may be provided for the development of Level I systems, the LGU and beneficiaries, concerned shall be required to provide any remaining amount as equity to the

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<sup>1</sup> The Department of Finance is considering aligning the LWUA lending rates to local water districts toward market rates to allow for a more efficient use of scarce resources, as well as to provide for consistent policy on lending to LGUs by government financial institutions.

investment. No subsidies from the national government shall be provided for Levels II and III systems.<sup>2</sup>

In providing for Level III service, the LGUs may opt to form a water district or an LGU company, provide a franchise to a private party or participate in a joint venture with a private party. Except in areas with water districts, LGUs shall maintain overall responsibility for ensuring consumer satisfaction through the exercise of institutional and/or contractual regulatory powers over local water utilities<sup>3</sup>, in collaboration with other national regulatory agencies, and by instituting a system of public performance audit.

Cost recovery through user payments shall be encouraged for both capital and operation and maintenance costs. However, at the minimum, user payments shall be required to cover the operation and maintenance costs in all services levels. For LGU- owned, operated and/or guaranteed systems, any shortfall in revenues required for loan repayment shall be financed by the LGU from its Internal Revenue Allotment and/or locally-generated revenues, following a process of negotiation between the LGU and the beneficiaries concerned on the level of user payments.

For systems managed by local water districts, full cost recovery, through user charges, is required by LWUA.

In areas where there are existing local water districts, LGUs may finance rehabilitation works and/or expansion of the existing waterworks system on the following conditions:

- a. The local water district concerned is not in LWUA's current program of assistance, that is, it is not included in any loan of LWUA with a financing institution, and
- b. Endorsement by the local water district concerned should have been secured.

In the event that the local water district is servicing a loan from LWUA, the local water district shall seek clearance from LWUA prior to entering into an agreement with the LGU concerned on any program of system expansion.

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<sup>2</sup> This policy has been approved by the Investment Coordination Committee of the NEDA Board.

<sup>3</sup> As per Presidential Decree No. 198 (Provincial Water Utilities Act), LWUA regulates the technical standards and the tariffs of local water districts, based on its requirement to issue a certificate of conformance on every loan disbursed to the latter. Source regulation is done by the National Water Resources Board. At the moment, there is no recourse by the LGU in case of non-performance by the local water district. This is an issue that needs to be addressed by Government.

**Article 8. Management of Systems.** LGUs shall adopt commercial principles in the operation and management of water utilities in order to provide cost-effective and reliable services to consumers, whether management of the system is a direct responsibility of the LGU or is contracted out by the LGU to the private sector. An LGU may also consider amalgamating or consolidating its system with that of its neighboring LGUs in order to benefit from economies of scale that could expand water supply services to consumers at the lowest possible cost.

For the operation and management of Level I and II systems, the LGUs shall initiate the formation of Barangay and Rural Waterworks and Sanitation Associations (BWSAs/RWSAs), respectively, through a participatory approach involving consultation with all stakeholders (Article 20) and assist in their registration with the appropriate authorities (Article 21). Upon request, LGUs may accredit duly registered RWSAs/BWSAs in order to enable them to avail of financial assistance from local governments. LGUs shall have an overall supervision of RWSAs and BWSAs.

**Article 9. Project Planning and Development.** Provinces and cities/municipalities shall be required to prepare, and update on an annual basis, provincial and city/municipal sector plans that are consistent with a national sector plan<sup>4</sup>. These sector plans shall be integrated into the local investment programs. Water supply projects shall be identified from the local investment program, a financing program of foreign and nationally/locally-generated resources, including private sector resources, shall support the local investment program.

**Article 10. Approval and Award of Contracts.** The LGUs shall be required to conduct public bidding, in accordance with the provisions of Law, including Presidential Decree No. 1594, as amended, Executive Order No.302 and other applicable laws, and shall have the final authority to approve and award contracts for water supply and sanitation projects within their jurisdictions.

**Article 11. Application for Water Rights.** LGUs or the concerned water utility shall apply for water rights from the National Water Resources Board prior to implementing a project that would require extraction of water.

**Article 12. Public Performance Audit.** The LGUs shall establish a system of public performance audit for public and private water utilities focusing on critical performance indicators. Upon request of the LGUs, DILG may provide technical assistance for this purpose, in coordination with appropriate national government agencies.<sup>5</sup>

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<sup>4</sup> ADB is assisting the preparation of a National Sector Plan for Water Supply, Sewerage and Sanitation for 1999-2004

<sup>5</sup> This system shall be pilot-tested in Metro Manila by the MWSS with World Bank financing.

**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. Registered 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 from 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 these project packages (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 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 ON THE DELINEATION OF  
RESPONSIBILITIES IN THE DEVELOPMENT AND  
IMPLEMENTATION 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.**

**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 these requirements 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, NBDA 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.**

**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.**

MATRIX OF FINANCING AND MANAGEMENT OPTIONS

<u>Option</u>	<u>Description</u>
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  
Water Source Information

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)			Page: 1 of 1		
Content: Water Source - General Information			Date:		
Data Collection Level: Provincial		Province No.: 1303		Filename: Water Source.xls	
Region Number: XIII		Province Name: Agusan Del Sur		Form Number: P.4.1	
	Type of Water Source		Shallow Well	Deep Well	Spring
Imple- mentor	Total number of water sources	Number	1,271	328	266
	Government Agency	Number	590	286	214
	Private	Number	681	42	2
Level	Level I	Number	1,271	323	182
	Level II	Number		1	57
	Level III	Number		4	27
Owne- rship	Water District	Number			
	MEO/CEO	Number		2	
	RWSA	Number		11	
	BWSA	Number		15	50
	Institution	Number			
	Commercial Establishment	Number			
	Industrial/Agricultural Undertakin	Number			
	Public (Domestic)	Number	590	271	197
Private (Domestic)	Number	681	45		
Abstrac- tion	Submersible/Turbine	Number		2	
	Centrifugal	Number		7	
	Handpump	Number	1,155	319	
	Bucket & Rope	Number	116		
	Free Flowing	Number			266
Usage	Drinking	Number	1,271	328	266
	Washing/Bathing	Number	1,271	328	266
	Gardening/Irrigation	Number	1,271	328	266
	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	247	85	1
Treated	Number			1	
Production	Seasonal Production	Number			
	Average Capacity < 100 m <sup>3</sup> /day	Number	1,271	34	176
	Average Capacity >= 100 m <sup>3</sup> /day	Number		4	25
	Number of Household < 5	Number			
	Number of Household >= 5	Number	10,405	4,490	9,942

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PWASP)							Page: 1 of 1		
Content: Water Source - General Information							Date:		
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls		
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1		
	Name of Municipalities	Character	Sibagat			Bayugan			
			Type of Water Source	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	87			47	643	31	46
Imple- mentor	Government Agency	Number	25				187	28	46
	Private	Number	62				456	3	
Level	Level I	Number	87			32	643	31	37
	Level II	Number				14			7
	Level III	Number				1			2
Ownership	Water District	Number							
	MEO/CEO	Number							
	RWSA	Number							
	BWSA	Number				14			9
	Institution	Number							
	Commercial Establishment	Number							
	Industrial/Agricultural Undertaking	Number							
	Public (Domestic)	Number	25			47	187	28	37
Private (Domestic)	Number	62				456	3		
Abstraction	Submersible/Turbine	Number							
	Centrifugal	Number							
	Handpump	Number	87				643	31	
	Bucket & Rope	Number							
	Free Flowing	Number				47			46
Usage	Drinking	Number	87			47	643	31	46
	Washing/Bathing	Number	87			47	643	31	46
	Gardening/Irrigation	Number	87			47	643	31	46
	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							
Production	Treated	Number							
	Seasonal Production	Number							
	Average Capacity < 100 m <sup>3</sup> /day	Number				47			
	Average Capacity >= 100 m <sup>3</sup> /day	Number							
	Number of Household < 5	Number							
Number of Household >= 5	Number		1,022			1,053	3,261	423	915

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	Prosperidad			Rosario		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
imple- men- tion	Total number of water sources	Number	21	5	26	10	11	13
	Government Agency	Number	21	5	26	4	11	13
	Private	Number				6		
Level	Level I	Number	21	5	22	10	11	9
	Level II	Number						2
	Level III	Number			4			2
Ownership	Water District	Number			1			
	MEO/CEO	Number			1			1
	RWSA	Number						
	BWSA	Number			1			2
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertakin	Number						
	Public (Domestic)	Number	21	5	22	4	11	10
Private (Domestic)	Number				6			
Abstraction	Submersible/Turbine	Number						
	Centrifugal	Number						
	Handpump	Number	21	5		10	11	
	Racket & Rope	Number						
	Free Flowing	Number			22			13
Usage	Drinking	Number	21	5	26	10	11	13
	Washing/Bathing	Number	21	5	26	10	11	13
	Gardening/Irrigation	Number	21		26	10	11	13
	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				10	11	
Production	Treated	Number						
	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /day	Number			23			9
	Average Capacity >= 100 m <sup>3</sup> /day	Number			3			4
	Number of Household < 5	Number						
Number of Household >= 5	Number	476	75	3,613	150	165	810	

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	Bunawan			Esperanza		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	8	15	19	132	48	5
Imple- mentor	Government Agency	Number	8	15	15	101	41	5
	Private	Number			4	31	7	
Level	Level I	Number	8	15	11	132	46	
	Level II	Number			7			5
	Level III	Number			1		2	
Ownership	Water District	Number			1			
	MEO/CEO	Number					1	
	RWSA	Number			7		1	
	BWSA	Number					4	5
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertaking	Number						
	Public (Domestic)	Number	8	15	11	101	40	
Private (Domestic)	Number				31	7		
Abstraction	Submersible/Turbine	Number					1	
	Centrifugal	Number					1	
	Handpump	Number	8	15		132	46	
	Bucket & Rope	Number						
	Free Flowing	Number			19			5
Usage	Drinking	Number	8	15	19	132	48	5
	Washing/Bathing	Number	8	15	19	132	48	5
	Gardening/Irrigation	Number	8	15	19	132	48	5
	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	8	15	19	132		
Treated	Number							
Production	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /day	Number					2	5
	Average Capacity >= 100 m <sup>3</sup> /day	Number						
	Number of Household < 5	Number						
	Number of Household >= 5	Number		120	225	545	1,552	772

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	San Francisco			Sta. Josefa		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	32	43	29	18	14	4
Imp- mentor	Government Agency	Number	31	19	28	18	14	4
	Private	Number	18	24	1			
Level:	Level I	Number	32	43	12	18	13	4
	Level II	Number						
	Level III	Number			17		1	
Ownership	Water District	Number			1			
	MFO/CEO	Number			3		1	
	RWSA	Number						
	BWSA	Number						
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertak	Number						
	Public (Domestic)	Number	32	19	12	18	13	4
Private (Domestic)	Number		24					
Abstraction	Submersible/Turbine	Number					1	
	Centrifugal	Number						
	Handpump	Number	32	43		18	13	
	Bucket & Rope	Number						
	Free Flowing	Number			28			
Usage	Drinking	Number	32	43	28	18	14	4
	Washing/Bathing	Number	32	43	28	18	14	4
	Gardening/Irrigation	Number	32	43	28	18	14	4
	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			1			
	Treated	Number			1			
Production	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /da	Number			25			
	Average Capacity >= 100 m <sup>3</sup> /d	Number			4			
	Number of Household < 5	Number						
	Number of Household >= 5	Number	482	312	3,395	277	195	75

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	Talaogon			Trento		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
	Total number of water sources	Number	20	24	12	159	41	8
Implementor	Government Agency	Number	20	24	12	43	39	8
	Private	Number				116	2	
Level	Level I	Number	20	23	7	159	40	7
	Level II	Number		1	5			1
	Level III	Number					1	
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number		2	5			
	BWSA	Number						
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertakin	Number						
	Public (Domestic)	Number	20	23	7	43	39	8
Private (Domestic)	Number				116	2		
Abstraction	Submersible/Turbine	Number		1				
	Centrifugal	Number					6	
	Handpump	Number	20	23			35	
	Bucket & Rope	Number						
	Free Flowing	Number			12			8
Usage	Drinking	Number	20	24	12	159	41	8
	Washing/Bathing	Number	20	24	12	159	41	8
	Gardening/Irrigation	Number	20	24	12	159	41	8
	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	20	24				
Treated	Number							
Production	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /day	Number		2	12			8
	Average Capacity >= 100 m <sup>3</sup> /day	Number						
	Number of Household < 5	Number						
Number of Household >= 5	Number	300	395	175	762	572	130	

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	Veruela			La Paz		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
Implementor	Total number of water sources		15	12	19	21	19	4
	Government Agency	Number	15	12	19	14	13	4
	Private	Number				7	6	
Level	Level I	Number	15	12	10	21	19	4
	Level II	Number			9			
	Level III	Number						
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number		1	10		2	
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertakin	Number						
	Public (Domestic)	Number	15	11	10	14	11	4
Private (Domestic)	Number				7	6		
Abstraction	Submersible/Turbine	Number						
	Centrifugal	Number						
	Handpump	Number	15	12			19	
	Bucket & Rope	Number						
	Free Flowing	Number			19			4
Usage	Drinking	Number	15	12	19	21	19	4
	Washing/Bathing	Number	15	12	19	21	19	4
	Gardening/Irrigation	Number	15	12	19	21	19	4
	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						
Production	Treated	Number						
	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /day	Number			13			4
	Average Capacity >= 100 m <sup>3</sup> /day	Number			6			
	Number of Household < 5	Number						
Number of Household >= 5	Number	225	180	321	217	201	60	

Provincial Water Supply, Sewerage And Sanitation Sector Plan (PW4SP)							Page: 1 of 1	
Content: Water Source - General Information							Date:	
Data Collection Level: Provincial				Province No.: 1303			Filename: Water Source.xls	
Region Number: XIII				Province Name: Agusan Del Sur			Form Number: P.4.1	
	Name of Municipalities	Character	Loreto			San Luis		
	Type of Water Source	Number	Shallow Well	Deep Well	Spring	Shallow Well	Deep Well	Spring
Imple- mentor	Total number of water sources		34	31	12	71	34	22
	Government Agency	Number	34	31	9	69	34	22
Level	Private	Number			3	2		
	Level I	Number	34	31	8	71	34	19
	Level II	Number			4			3
	Level III	Number						
Ownership	Water District	Number						
	MEO/CEO	Number						
	RWSA	Number						
	BWSA	Number			4		8	4
	Institution	Number						
	Commercial Establishment	Number						
	Industrial/Agricultural Undertakin	Number						
	Public (Domestic)	Number	34	31	9	69	26	18
Abstraction	Private (Domestic)	Number			3	2		
	Submersible/Turbine	Number						
	Centrifugal	Number						
	Handpump	Number	34	31		71	32	
	Bucket & Rope	Number						
Usage	Free Flowing	Number					2	22
	Drinking	Number	34	31	12	71	34	22
	Washing/Bathing	Number	34	31	12	71	34	22
	Gardening/Irrigation	Number	34	31	12	71	34	22
	Big-Scale Irrigation	Number						
Water Quality	Production	Number						
	No Quality Problem	Number						
	High Iron/Manganese Content	Number						
	High Chloride Content	Number						
	Turbidity/Colored/Smell	Number						
	Polluted/Contaminated	Number						
	Chlorinated	Number				71	34	
Treated	Number							
Production	Seasonal Production	Number						
	Average Capacity < 100 m <sup>3</sup> /day	Number				71	34	22
	Average Capacity >= 100 m <sup>3</sup> /day	Number						
	Number of Household < 5	Number						
	Number of Household >= 5	Number	524	465	270	1,037	510	325



Table 7.3.1 Major References

No.	REPORT/INFORMATION	AGENCY/AUTHOR	CONTENTS	REFERENCE DATA/DESCRIPTION	OUTPUT
1.	Topographic Map (1:250,000)	NAMRIA	topographic contours, natural waterways, road, etc.	highest peak, major river basins	river networks, base maps, river basins of province
2.	Rapid Assessment of Water Supply Sources	NWRB	groundwater availability, well data and inventory	well description, specific capacity, static water levels, well depths	groundwater potential area map
3.	Individual Well Information Database	NWRB	well location, well information	well depths, water levels, well location	individual well location map
4.	Groundwater Resources Investigation	NWRB	groundwater availability area, salt water intrusion, resistivity results	resistivity survey results, potential area for high yielding wells, salt water intrusion	potential area for high yielding wells, salt water intrusion areas
5.	Geological Map of the Philippines	BMGS	lithologic distribution and structural features of the Philippines	geologic formations of the province	provincial geologic maps
6.	Philippine Water Resources Summary Data	NWRB	stream flow and lake and river stage	flow rate measurements and drainage areas of major rivers of the province	river discharges in the province
7.	Road Network Map of the province	DPWH-DEO, PEO, PPDO	municipal boundaries	municipal boundaries, location of barangays	base maps, municipal boundaries
8.	Feasibility Study of Sungao Memo Water District(SMWD)	SMWD/LWUA	recommended water sources for MSWD	well data information, water level	groundwater potential area map
9.	Water Quality Analysis Result	SMWD	water quality results	water quality	water quality map
10.	Assessment of the impact of Mat-1 gold mining workings on surface waters and nearshore environment of Surigao City	SMWD Sungao City 1996	extent of mercury pollution of Surigao River and its environment	environmental pollution caused by small scale gold mining in the area	water quality report of Surigao City
11.	Individual Well Inventory	DPWH-DEO,	well location, well information	well depths, water levels	individual well location map
12.	Water Quality Analysis Result	Agusan del Norte	water quality results	water quality evaluation	water quality map
13.	Individual Well Inventory	DPWH-DEO,	well location, well information	well depth, water levels	individual well location map
14.	Spring Inventory	Agusan del Sur	location of springs, discharge	spring data analysis	spring inventory report

continue next page

Table 7.3.1 Major References (Cont. d)

No.	REPORT/INFORMATION	AGENCY/AUTHOR	CONTENTS	REFERENCE DATA/DESCRIPTION	OUTPUT
15.	Individual Well inventory	DPWH-DEO, Davao del Sur	well location, well information	well depths, Water levels	individual well location map
16.	Spring Inventory		location of springs, discharge	spring discharge, location	spring inventory report
17.	Well Log Records		geologic information	geologic formations of the province	groundwater potential
18.	Water Quality Analysis Result		water quality results	water quality	water quality map
19.	Well Drilling Log Records	DPWH-DEO, Davao Oriental	geologic information	geologic formations of the province	groundwater potential
20.	Individual Well Inventory		well location, well information	well location, well depths	individual well location map
21.	Pumping Test Data		pumping test results	pumping test data	potential area for high yielding
22.	Water Quality Analysis Result		water quality results	water quality	water quality maps
23.	Assessment of the Domestic Water Supply and Sanitation Facilities in Southern Mindanao Vol. III Water and Sanitation, Davao Oriental	NEDA Regional Office November 1997	general information of water resources	surface water, groundwater resources, water quality and quantity	surface water source, groundwater source, water quality reports

concluded page

Table 7.3.2 Well Inventory by Municipality

MUNICIPAL	LOCATION	WELL NO. (mbgs)	DATE	DEPTH (m)	SWL (mbgs)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
Bayugan	Balbueco	BPW26232		18.29	0.92	0.95				
Bayugan	Bayugan	BPW16970		21.34	3.66	0.50	2.38	0.210		
Bayugan	Bayugan	BPW26231		15.85	0.92	0.19				
Bayugan	Bayugan Central E/S	BPW37607	08/13/76	17.07	4.57	0.63	0.61	1.030		
Bayugan	Bayugan School Site, Bocac	BPW37616	11/27/76	30.48		0.44	1.21	0.360		
Bayugan	Bocac Bayugan E/S	BPW37616		59.76	1.83	0.44				
Bayugan	Old Bayugan	BPW26134		14.63	4.57	0.63		0.620		
Bayugan	Poblacion Market Site	BPW3760	05/10/76	24.39	3.66	0.96		0.620		
Bayugan	Poblacion Market Site	BPW37606		24.39	3.66	0.96	1.55	0.620		
Bayugan	West Bayugan Elementary School	BPW37612		16.77	3.05	0.63	1.53	0.410		
Bunawan	Co-o	BPW37615	12/15/76	11.59	3.05	0.51	5.10	0.100		
Bunawan	Mambaliti	BPW10172		85.37	16.77	0.76	3.04	0.250		
Bunawan	Mambaliti	BPW31603		24.39						
Bunawan	Market Site	BPW37602		27.13	4.57	0.44	2.93	0.150		
Bunawan	National Agricultural School	BPW-7004		76.21	2.74	0.63	0.91	0.690		
Bunawan	National Agricultural School	BPW10171		45.12	16.77	3.78	6.09	0.620		
Bunawan	National High School	BPW7005		19.21	5.18	1.26	3.31	0.380		
Bunawan	Poblacion	BPW-7002		31.49	3.66	0.69	3.83	0.800		
Bunawan	Poblacion	BPW-7003		42.68	4.87	0.63	3.50	1.800		
Esperanza	Andanan	NWS26033	04/15/60	17.37	2.74	0.44	2.75	0.160		
Esperanza	Bayanakon, Mabutay	BPW73935		10.37	5.79	0.32	1.52	0.210		
Esperanza	Bayugan	BP169760	05/18/57	21.54	3.66	0.50	2.50	0.200		
Esperanza	Bayugan	NWS16972	08/0257	20.42	3.65	0.44	2.44	0.180		
Esperanza	Benibon	BPW26234		14.02	0.92	0.63				
Esperanza	Dakutan	BPW14177	04/13/57	32.01	2.74	0.37	0.90	0.410		
Esperanza	Duang-an	BPW26233		20.12	4.57					
Esperanza	Guadalupe	NWS16975	11/08/57	34.75	6.40	0.44	0.92	0.480		
Esperanza	Mahayahay	NWS26031	02/09/60	18.29	6.09	0.63	1.54	0.410		
Esperanza	Mambutay	BPW16974	01/16/58	18.29	12.20	0.44	0.61	0.780		

MUNICIPAL	LOCATION	WELL NO. (mbgs)	DATE	DEPTH (m)	SWL - (mbgs)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
Buenavista	Rizal, Crossing Cogon	BPW14168	08/18/56	12.20	1.83	0.32	1.52	0.210		
Buenavista	Sacol	BPW14169	12/0085	10.97	1.21	0.62	1.21	0.508		
Buenavista	Sacol	BPW-9095	03/12/56	60.97	3.04	1.26				
Buenavista	Sacol Cabulacan	BPW14171	11/10/56	11.58	2.13	0.63	1.85	0.340		
Butuan City	Agusan Agricultural High School	BPW10920	07/07/56	67.68		3.15				
Butuan City	Agusan Agricultural School	BPW26117		42.68	0.92	0.16				
Butuan City	Agusan High School	BPW-9472	10/26/55	41.15	6.10	1.33				
Butuan City	Agusan Pequeno	BPW-9077		60.98	7.32	1.26	4.20	0.300		
Butuan City	Alviola	W# 1	11/01/78	91.00	1.59	50.78	6.37			
Butuan City	Alviola	W# 2		134.00						
Butuan City	Ambago	NWS19877	04/12/59	27.43	1.52	0.31	1.56	0.200		
Butuan City	Amparo Elementary School	NWS26035	06/13/60	53.65	6.09	0.31	1.55	0.200		
Butuan City	Ampayon	BPW-5111	09/25/49	49.78	0.91	0.31				
Butuan City	Ampayon	NWS25932	08/31/59	48.78	3.05	0.63				
Butuan City	Ampayon Health Center	BPW21842		63.42	2.44					
Butuan City	Ampayon Km. 5	NWS20162	04/18/58	63.41						
Butuan City	Ampayon Km. 8	BPW26214		56.40	3.05					
Butuan City	Ampayon Km. 944	BPW-8466	07/22/55	62.49	5.80	1.26				
Butuan City	Ampayon, Salvacion	BPW26224		36.59	2.13					
Butuan City	Antongalon	BPW-8471	01/12/56	53.96	0.30	0.50	0.60	1.050		
Butuan City	Antongalon	NWS25933	10/04/59	39.63	0.91	0.63	1.85	0.340		
Butuan City	Aupagan	BPW-2641		35.98	5.79	0.63	2.11	0.180		
Butuan City	Aupagan	BPW10784	08/17/56	6.10	1.22	0.38				
Butuan City	Baan	BPW-4709		76.83		5.04				
Butuan City	Baan Km. 341	BPW-8467	07/31/55	73.17	Flowing					
Butuan City	Baan Km. 4	NWS20168	01/15/59	74.69	1.83	3.79				
Butuan City	Baan Riverside	BPW16979		84.15	Fr. Flow					
Butuan City	Baan, Buhangin	NWS26121	03/15/61	88.41	0.61	0.94				
Butuan City	Babag	NWS20207	06/03/59	54.87	-2.13	1.58				
Butuan City	Bacling	BPW26116		73.17	2.44					
Butuan City	Bading	BPW-5109		70.12	Fr. Flow	0.76				
Butuan City	Bancasi	BPW25912		65.55	4.57					
Butuan City	Bancasi	BPW26113		75.00	1.83	1.89				

MUNICIPAL	LOCATION	WELL NO. (mbgs)	DATE	DEPTH (m)	SWL (mbgs)	DISCHARGE (lps)	DRAWDOWN (m)	SPPCP (lps/m)	USAGE	REMARKS
Butuan City	Lopez Jeena	BPW-2632		82.32	1.52	0.57				
Butuan City	Los Angeles	BPW10407	02/22/56	42.69	3.04	2.52	4.94	0.510		
Butuan City	Los Angeles 15 Km.	NWS19874	08/25/58	60.97	-2.13	0.44				
Butuan City	Los Angeles Km. 13	BPW19875	09/29/58	89.63	0.61	0.19				
Butuan City	Los Angeles Km. 12	BPW21771		14.63	1.22					
Butuan City	Los Angeles Km. 12	NWS26013	07/25/60	64.02	4.57	2.83				
Butuan City	Lower Tinivasan	BPW-2638		64.02	3.05					
Butuan City	Lumbocan	BPW-2661		189.02	2.13		1.88	0.170		
Butuan City	Magallanes	BPW-5737		58.23	0.61	0.32				
Butuan City	Magallanes	BPW-6750	07/14/55	85.38	0.91					
Butuan City	Magallanes	NWS20206	05/05/59	64.02	-1.22	9.47				
Butuan City	Magallanes	BPW26225		75.00	4.27	0.63				
Butuan City	Mahay	BPW15261	04/27/57	36.58	-6.10	5.05				
Butuan City	Maibu	NWS20516	09/24/58	48.78	1.53	0.31	1.55	0.200		
Butuan City	Malalag	BPW26221		16.46	1.52					
Butuan City	Mandamo	BPW 2671								
Butuan City	Mantagua	BPW-2635		56.40	3.05	3.78				
Butuan City	Maug	BPW16977	03/15/58	83.84	0.61	0.63	1.55	0.410		
Butuan City	Maug	NWS16978	08/28/58	50.34	0.60	0.63	0.91	0.690		
Butuan City	Maug	BPW20202		97.56	0.61					
Butuan City	Old Hospital Site	BPW26310	03/18/60	12.50	4.57	0.63	0.30	2.070		
Butuan City	Pianing	NWS26011	09/15/59	60.97		0.50	1.21	0.410		
Butuan City	Pigdaulan	NWS-2591		102.74	19.81	0.25	5.00	0.050		
Butuan City	Pinamanculan	BPW-2662		58.94	.92	1.89				
Butuan City	Plaza Plywood Plant	BPW-5101	09/15/49	76.21	1.83	3.16				
Butuan City	Poblacion	BPW19873		2.74	1.52					
Butuan City	Poblacion	NWS21841	06/20/61	94.51	0.91	0.57				
Butuan City	Poblacion	BPW26115	02/07/50	73.19	2.13	2.21				
Butuan City	Poyohan	NWS26113		74.99	-1.83	2.84				
Butuan City	Rosales St.	BPW-8474		79.26	5.49	1.26				
Butuan City	San Francisco St.	BPW-5102		83.84		5.04				
Butuan City	San Ignacio	BPW26263		19.82	1.83	0.95				
Butuan City	San Mateo Florida Camp	BPW-5088		76.83		0.95	0.29	1.680		
Butuan City	San Vicente									

MUNICIPAL	LOCATION	WELL NO. (mbsg)	DATE	DEPTH (m)	SWL (mbsg)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
Bunuan City	San Vicente	BPW-6749	05/24/55	15.85	0.30	0.50	1.52	0.827		
Bunuan City	San Vicente	BPW-9098		44.21	3.05	1.26	1.52	0.210		
Bunuan City	Siladbuan	BPW26216		10.67	1.52	0.32				
Bunuan City	Skid Tungao	BPW26222		36.59	6.71					
Bunuan City	Sumilihon	BPW-5142	11/26/49	37.49	-1.22	0.50				
Bunuan City	Sumilihon School Site	BPW26215		45.73	2.44	0.95				
Bunuan City	T. Calo St.	NWS26112	05/25/61	76.24	1.52	1.26				
Bunuan City	Tagabaca	NWS26024	11/14/60	33.59	4.57	0.50	0.61	0.820		
Bunuan City	Taguibo	BPW-8470	09/20/55	10.98	3.05	2.13	1.47	1.450		
Bunuan City	Taligaman		08/20/83	42.67		1.26				
Bunuan City	Taligaman	NWS25913	11/03/59	51.82	0.30	0.63	1.53	0.410		
Bunuan City	Taligaman School Site	BPW26313		21.34	0.92					
Bunuan City	Tumampi	BPW25923	11/15/59	42.10	2.13	5.04				
Bunuan City	Tumampi	BPW26217		60.98	2.44	0.76				
Bunuan City	Ubod-ubod	BPW-8469	09/01/55	35.36	Flowing	0.63		1.030		
Cabadbaran	A. Luna	BPW-7008	09/22/55	44.51	9.15	1.90				
Cabadbaran	Across A.I.S.	BPW15262	06/01/57	54.87	4.57	2.52				
Cabadbaran	Balangalang	W# 15263	07/12/57	10.36	4.57	0.32				
Cabadbaran	Balangalang	W# 2752	05/15/75	10.67	3.66	0.51	3.40	0.150		
Cabadbaran	Bay-ang	BPW-5909		62.20	0.92	0.63	0.91	0.690		
Cabadbaran	Bay-ang	BPW10926	11/23/56	9.67	2.13	0.32	1.88	0.170		
Cabadbaran	Bayabas	BPW10921		24.70	9.76	0.32	0.61	0.520		
Cabadbaran	Bogho	BPW		11.28	0.92	0.63				
Cabadbaran	Caasinan	BPW-4880		54.27	0.32	0.06				
Cabadbaran	Cabadbaran Central School	NWS26111	02/28/61	53.65	-3.05	1.70				
Cabadbaran	Cabinet	BPW-4966		44.82	0.46	0.22				
Cabadbaran	Cabinet	BPW15260	04/14/57	67.68	-0.91	0.19				
Cabadbaran	Calamba	BPW-2292		94.51	19.82					
Cabadbaran	Calamba	NWS20164	09/08/58	49.08	23.78	0.63	3.15	0.200		
Cabadbaran	Calamba, Calolistoy	NWS26041	09/15/60	30.48	3.04	0.94	1.52	0.620		
Cabadbaran	Calibunan, Highway	BPW15258	12/19/56	50.30	-3.66	3.16				
Cabadbaran	Del Pilar	BPW-8475	03/16/56	54.87	3.65	0.31	3.44	0.090		
Cabadbaran	Hinasdanan Km. 368	BPW10917		23.17	2.44	0.44	0.30	1.450		

MUNICIPAL	LOCATION	WELL NO. (mogs)	DATE	DEPTH (m)	SWL (mogs)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
Cabadbaran	Riumilog	NWS20163	05/25/58	68.59	0.91	3.78	4.50	0.800		
Cabadbaran	Kauswagan	BP202062		60.98	1.52					
Cabadbaran	Kauswagan	BPW-1322		60.67	0.92	0.38				
Cabadbaran	Kauswagan	BPW26131		55.18	1.52					
Cabadbaran	La Union	BPW10922		46.04	4.27	1.58				
Cabadbaran	Mabini, Dinabuksan	BPW26236		12.20	2.13	0.63				
Cabadbaran	Market Site	NWS25914	01/04/60	60.97	3.96	6.31				
Cabadbaran	Minaano	BPW10924	10/16/56	52.74		11.36				
Cabadbaran	Osmena Avenue	BPW-4848		39.63	Fr. Flow	0.88				
Cabadbaran	Panaytayon	BPW10925	11/02/56	57.92	Flowing	0.68	0.30	2.100		
Cabadbaran	Poblacion	BPW18933		71.65	0.61	0.32				
Cabadbaran	Sanghan	NWS26014	09/24/60	58.53	3.05	0.44				
Cabadbaran	Sanghan Km. 360	BPW10923		35.06	3.05					
Cabadbaran	Sitio Mayboo	BPW15261	04/27/57	36.58	Flowing	5.05				
Cabadbaran	Talo-ao	BPW26061	06/29/60	15.24	1.52	0.32	4.57	0.070		
Cabadbaran	Tolosa	BPW-5896	11/25/53	65.54		0.76				
Cabadbaran	Tubay-tubay	BPW10404		27.44	0.92	2.52				
Carmen	Bolihon	BPW20513	01/06/53	18.29	3.66	0.32				
Carmen	Cahayagan	BPW 9091	06/19/56	60.98	1.83	0.63	0.61	1.030		
Carmen	Cervantina	BPW10177		153.66	7.62					
Carmen	Gosoon Dacu	BPW 9093	06/28/56	67.98		0.69		0.280		
Carmen	Gosoon, Capatagan	BPW10179		25.92	13.72	0.44				
Carmen	Maritaa	NWS26025	01/19/61	15.24	3.04	0.63	1.54	0.410		
Carmen	Poblacion	BPW-2631		36.28	2.44	6.62				
Carmen	Poblacion	BPW-2753	06/14/75	7.93	1.52	0.51				
Carmen	San Agustin	BPW-9092	06/17/56	36.58	1.82	2.52	0.91	2.770		
Carmen	Uba	BPW20512	10/33/57	10.67	2.13	0.51	1.54	0.330		
Carmen	Vinapas	BPW10173		24.70	15.20	0.44	4.40	0.100		
Jabonga	Baliguian	BPW-5724	02/20/53	21.03	2.13	0.25				
Jabonga	Baliguian	BPW5266	09/18/57	28.96	1.22	0.31				
Jabonga	Bangonay	BPW20201	01/19/58	9.15	3.35	0.31	0.31	1.030		
Jabonga	Bangonay	BPW26239		12.20	3.05	0.63				
Jabonga	Cuyato	BPW20200	12/09/57	15.24	0.92	0.63	1.53	0.410		

MUNICIPAL	LOCATION	WELL NO. (mbs)	DATE	DEPTH (m)	SWL (mbs)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
Jabonga	Libas Km. 389	BPW10918	14/25/56	25.61	3.96	0.44	0.92	0.480		
Jabonga	Magsaysay	BPW25921	08/31/59	17.68	1.83	0.63	0.61	1.030		
Kitcharao	Canaway Salisbong	BPW15265		10.98	1.22	0.32				
Kitcharao	Gawatan	BPW26015		21.34	1.22	0.63				
Kitcharao	Jalibong	BPW10919	05/20/56	23.17	0.60	0.50	0.59	0.840		
Kitcharao	Jalibong Km. 402	BPW-5652	01/31/53	26.21	0.60	0.63	0.91	0.690		
Kitcharao	Mahayahay	BPW14173	02/01/57	7.93	1.52	0.32	2.13	0.150		
Kitcharao	San Isidro Jalibong	BPW15267	11/01/57	14.94	6.71	0.32	4.00	0.080		
Kitcharao	San Roque	NWS26016	02/07/61	14.93	1.37	0.63	0.15	4.130		
Kitcharao	San Roque Km. 404	BPW 6083	04/21/54	23.78	0.92	0.50	1.78	0.280		
Kitcharao	Canaway	BPW15265								
Las Nieves	Ambacon	BPW14175	02/12/57	18.29	4.27	0.38	1.22	0.310		
Las Nieves	Poblacion	BPW14174	02/06/57	54.87						
Magallanes	Poblacion	W#- 2755	08/16/75							
Magallanes	Taod-oy	NWS19876	11/04/58	30.38	1.52	0.32	0.31	1.030		
Nasipit	Amontay	BPW20515	03/11/58	9.15	3.35	0.32	1.78	0.280		
Nasipit	Amontay, Camagong	W# 9096	05/15/56	24.70	2.44	0.51				
Nasipit	Ata-Atahon	BPW-5553	09/04/52	10.98	1.22	0.38				
Nasipit	Ata-Atahon	BPW10785	08/17/56	9.15	0.91	0.38	0.30	1.270		
Nasipit	Cabagnukan	BPW10786	09/03/56	15.24	0.91	0.44	3.38	0.130		
Nasipit	Cubi-Cubi	BPW-6038	03/23/54	9.76	2.44	0.63	0.30	2.100		
Nasipit	Culit	BPW10787	09/04/56	32.01	2.13	0.38	7.60	0.050		
Nasipit	Igpalas	BPW10568	06/28/56	11.59	1.83	1.14	0.91	1.250		
Nasipit	Junction	BPW10565	06/01/56	30.49	18.60	0.44	1.22	0.360		
Nasipit	Kinabjangan Km. 316	BPW-5568	10/16/52	88.11	0.92	0.50	2.78	0.180		
Nasipit	Poblacion	BPW-8473	12/11/55	43.59	15.85	0.32	8.00	0.040		
Nasipit	Poblacion	BPW10567		54.88	19.82					
Nasipit	Punta	NWS10566	05/16/56	15.85	0.30	1.26	1.52	0.830		
Nasipit	Sitio Aclan	NWS20514	02/10/58	19.82	3.66	0.32				
Nasipit	Sta. Ana	BPW-7009	11/15/55	20.42	11.58	0.94	0.30	3.150		
Nasipit	Sta. Ana	BPW26141	08/03/61	14.63	8.23	0.63		0.690		
Nasipit	Talsay	BPW10564	05/14/56	37.20	2.44	1.26	5.25	0.240		
Nasipit	Tnangulo	BPW10788	10/09/56	54.27	10.67	0.32	10.67	0.030		



MUNICIPAL	LOCATION	WELL NO. (mbs)	DATE	DEPTH (m)	SWL (mbs)	DISCHARGE (lps)	DRAWDOWN (m)	SPCCP (lps/m)	USAGE	REMARKS
San Francisco	Pasta	BPW37614	01/04/77	24.39		0.44				
Tubay	Abucay	NWS-2602	09/15/60	41.15	2.44					
Tubay	Banag	19871	01/19/58	1098.00	2.13	0.44	0.30	1.450		
Tubay	Cabayawa	BPW-5616	11/19/52	56.40	1.23	0.38				
Tubay	Kinahiluan	NWS19870	12/24/57	18.59	13.71	0.44	0.30	1.470		
Tubay	La Fraternidad	BPW15259	03/03/57	38.81	3.65	0.31				
Tubay	Lawigan	BPW-7010	01/10/56	35.06	3.04	0.94	6.27	0.150		
Tubay	Poblacion	19872		53.96	0.61	0.32	3.56	0.090		
Tubay	Poblacion	2711		15.85	4.57	0.32	1.52	0.210		
Tubay	Suyutan	BPW-5054		56.40		0.50				
Tubay	Tagmamaray	10408	04/29/56	62.50	0.61	1.26	5.48	0.230		
Tubay	Tagmamaray	BPW-9606	03/06/56	29.87	6.08	0.94	4.70	0.200		
Tubay	Tagmamaray	NWS26142	09/29/61	32.53	5.18	0.94	0.90	1.040		
Tubay	Tubay-tubay	NWS-2603	11/13/60	77.74	-2.44	6.31				
Tubay	Victory	BPW19869	08/18/57	32.21	-1.98	0.25				

Table 7.3.3 Water Quality Analysis Data

Sampling Water Sources: Springs										
Region Number: XIII										
No.	Sampling Site	Sampling Date	pH	Color (PCU)	Turbidity (FTU)	Residual Chlorine (mg/liter)	Fe (mg/liter)	Mn (mg/liter)	Coliform Bacteria (count number x100)	Total Bacteria (count number)
1	San Nicolas, Talacogon	April 30, 1998	8.5	10	3.4		0.2	<0.05	No Detected	0
2	San Jose, San Luis	April 30, 1998	6.8	0	0.0		0.1	0.06	No Detected	11
3	Munitola, San Luis	April 30, 1998	7.3	0	0.0		0.1	0.17	0	0
4	Sta. Irene, Prosperidad	April 30, 1998	7.3	N.A.	0.0		0.1	0.09	No Detected	0
5	Salvacion, Prosperidad	April 30, 1998	7.5	N.A.	1.1		0.2	0.14	1,300	0
6	Prosperidad Water District	May 16, 1998	7.7	N.A.	9.6	0.58	0.2	0.05	600	0
7	Pob. Purok 21, Prosperidad	May 16, 1998	5.9	N.A.	5.9		0.4	0.30	120	0
8	Pain-ay Prosperidad W.D.	May 16, 1998	7.1	N.A.	32.5	0.22	0.4	0.16	300	0
9	Bunawan Water District	May 16, 1998	7.4	N.A.	0.0	0.30	0.1	0.08	400	0
10	San Teodoro, Bunawan	May 16, 1998	7.8	N.A.	2.2		0.1	0.07	0	0
11	Bunawan Brook, Bunawan	May 16, 1998	6.8	N.A.	34.7		0.4	0.30	300	0
12	Taganahay, Esperanza	May 16, 1998	6.0	N.A.	0.0		0.1	0.17	0	0
11	Hamogaway, Bavugan	May 20, 1998	7.4	N.A.	1.5		0.2	0.07	100	0
12	Osmena, Bavugan	April 20, 1998	7.1	N.A.	0.0		0.1	0.06	1,000	0

Table 7.3.3 Water Quality Analysis Data

Sampling Water Sources: Deep Wells (Level I/ II/ III)										Provincial Number:		
Region Number: XIII										Provincial Name: Arusan del Sur		
No.	Sampling Site	Sampling Date	pH	Color (PCU)	Turbidity (FTU)	Residual Chlorine (mg/liter)	Fe (mg/liter)	Mn (mg/liter)	Coliform Bacteria (count number x100)	Total Bacteria (count number)		
1	Brgy. II, Purok 5, San Francisco-1	April 14, 1998	7.6	0	0.9		0.5	0.50	0	0		
2	Brgy. II, Purok 5, San Francisco-2	April 14, 1998	7.5	4	0.5		0.2	<0.50	0	7		
3	Brgy. II, Purok 4, San Francisco-1	April 14, 1998	7.6	4	0.1		0.5	<0.50	10,000	0		
4	Brgy. II, Purok 4, San Francisco-2	April 14, 1998	7.7	0	2.1		1.0	<0.50	10,000	0		
5	Brgy. II, Purok 4, San Francisco-3	April 14, 1998	7.7	21	4.8		0.2	<0.50	0	0		
6	Brgy. IV, Purok 5, San Francisco-1	April 29, 1998	7.7	28	6.0		0.2	0.50	0	0		
7	Brgy. IV, Purok 3, San Francisco	April 29, 1998	8.5	6	9.6		0.5	<0.50	0	0		
8	Brgy. V, Purok 2, San Francisco	April 29, 1998	7.3	1	2.6		0.2	<0.50	60,000	0		
9	Brgy. IV, Purok 5, San Francisco-2	April 29, 1998	7.6	27	0.2		<0.2	<0.50	10,000	0		
10	Zillovia Purok I-B, Talacogon (F.F.)	April 30, 1998	7.9	5	3.6		0.5	<0.50	20,000	0		
11	Zillovia Purok I-A, Talacogon (F.F.)	April 30, 1998	8.2	0	2.0		0.5	<0.50	No detected	0		
12	Buena Gracia, Talacogon (L.II)	April 30, 1998	7.5	10	8.8		0.2	<0.50	170,000	8		
13	Buena Gracia, Purok Tumulactic, Talacogon	April 30, 1998	7.6	4	8.8		0.2	<0.50	No detected	No detected		
14	Zillovia, Talacogon-1	April 30, 1998	8.5	2	4.3		0.5	<0.50	No detected	0		
15	Zillovia, Talacogon-2	April 30, 1998	8.1	2	5.0		0.2	<0.50	100,000	3		
16	Don Alejandro, San Luis (F.F.)-1	April 30, 1998	7.1	0	1.4		0.2	0.11	No detected	0		
17	Poblacion Baptist, San Luis-1	April 30, 1998	7.4	0	0.0		0.3	0.30	No detected	0		
18	Poblacion, San Luis-2	April 30, 1998	7.5	0	2.4		0.3	0.28	No detected	0		
19	Poblacion, Don Maxima, San Luis-1	April 30, 1998	7.3	0	1.6		0.2	0.07	No detected	0		
20	Poblacion, Purok 8, San Luis	April 30, 1998	7.2	107	1.4		0.3	0.28	30,000	0		
21	Don Alejandro, San Luis-2	April 30, 1998	7.0	0	0.2		0.7	0.44	No detected	0		
22	Poblacion, Don Maxima, San Luis-2	April 30, 1998	7.5	27	0.9		0.1	0.08	No detected	0		
23	Poblacion, Purok 4, San Luis	April 30, 1998	7.1	10	9.5		0.2	0.11	No detected	0		
24	Dona Flavia, San Luis-1	April 30, 1998	7.5	0	1.5		0.3	0.20	0	0		
25	Dona Flavia, San Luis-2	April 30, 1998	7.4	21	0.2		0.1	0.10	0	2		
26	Patinay Purok 3, Prosperidad	May 16, 1998	7.3	N.A.	2.8		0.1	0.09	30,000	0		
27	San Teodoro, Binahanan, Bunawan-1	May 16, 1998	7.3	N.A.	0.5		0.1	0.09	0	0		
28	San Teodoro, Bunawan-2	May 16, 1998	6.6	N.A.	1.9		0.1	0.06	90,000	0		
29	San Teodoro, Bunawan-3	May 16, 1998	7.1	N.A.	4.2		0.3	0.05	200,000	2		
30	Esperanza Water District (L.III)	May 16, 1998	6.4	N.A.	3.4	0.04	0.2	0.10	40,000	0		
31	Labao, Esperanza	May 16, 1998	6.3	N.A.	74.0		0.4	0.30	40,000	3		

Note. N.A.: Not available

Table 7.3.3 Water Quality Analysis Data

Sampling Water Sources: Springs		Provincial Number:									
Region Number: XIII		Provincial Name: Agusan del Sur									
No.	Sampling Site	Sampling Date	pH	Color (PCU)	Turbidity (FTU)	Residual Chlorine (mg/liter)	Fe (mg/liter)	Mn (mg/liter)	Coliform Bacteria (count number x100)	Total Bacteria (count number)	
1	San Nicolas, Talscoagon	April 30, 1998	8.5	10	3.4		0.2	<0.05	No Detected	0	
2	San Jose, San Luis	April 30, 1998	6.8	0	0.0		0.1	0.06	Numerous	11	
3	Muritola, San Luis	April 30, 1998	7.3	0	0.0		0.1	0.17	0	0	
4	Sta. Irene, Prosperidad	April 30, 1998	7.3	N.A.	0.0		0.1	0.09	Numerous	0	
5	Salvacion, Prosperidad	April 30, 1998	7.5	N.A.	1.1		0.2	0.14	1,300	0	
6	Prosperidad Water District	May 16, 1998	7.7	N.A.	9.6	0.58	0.2	0.05	600	0	
7	Pob. Furok 21, Prosperidad	May 16, 1998	5.9	N.A.	5.9		0.4	0.30	120	0	
8	Patn-ay Prosperidad W.D.	May 16, 1998	7.1	N.A.	32.5	0.22	0.4	0.16	300	0	
9	Bunawan Water District	May 16, 1998	7.4	N.A.	0.0	0.30	0.1	0.08	400	0	
10	San Teodoro, Bunawan	May 16, 1998	7.8	N.A.	2.2		0.1	0.07	0	0	
11	Bunawan Brook, Bunawan	May 16, 1998	6.8	N.A.	34.7		0.4	0.30	300	0	
12	Taganahaw, Esperanza	May 16, 1998	6.0	N.A.	0.0		0.1	0.17	0	0	
11	Hamogaway, Bayugan	May 20, 1998	7.4	N.A.	1.5		0.2	0.07	100	0	
12	Osmena, Bayugan	April 20, 1998	7.1	N.A.	0.0		0.1	0.06	1,000	0	

(Note, N.A.: Not available)

Table 7.3.3 Water Quality Analysis Data

Sampling Water Sources: Deep Wells (Level I / II / III)		Provincial Name: Agusan del Sur									
Region Number: XIII		Sampling Date	pH	Color (PCU)	Turbidity (FTU)	Residual Chlorine (mg/liter)	Fe (mg/liter)	Mn (mg/liter)	Coliform Bacteria (count number x100)	Total Bacteria (count number)	
No.	Sampling Site										
1	Brgy. II, Purok 5, San Francisco-1	April 14, 1998	7.6	0	0.9		0.5	0.50	0	0	
2	Brgy. II, Purok 5, San Francisco-2	April 14, 1998	7.5	4	0.5		0.2	<0.50	0	7	
3	Brgy. II, Purok 4, San Francisco-1	April 14, 1998	7.6	4	0.1		0.5	<0.50	100	0	
4	Brgy. II, Purok 4, San Francisco-2	April 14, 1998	7.7	0	2.1		1.0	<0.50	100	0	
5	Brgy. II, Purok 4, San Francisco-3	April 14, 1998	7.7	21	4.8		0.2	<0.50	0	0	
6	Brgy. IV, Purok 5, San Francisco-1	April 29, 1998	7.7	28	0.0		0.2	0.50	0	0	
7	Brgy. IV, Purok 3, San Francisco	April 29, 1998	8.5	6	9.6		0.5	<0.50	0	0	
8	Brgy. V, Purok 2, San Francisco	April 29, 1998	7.3	1	2.6		0.2	<0.50	600	0	
9	Brgy. IV, Purok 5, San Francisco-2	April 29, 1998	7.6	27	0.2		<0.2	<0.50	100	0	
10	Zillovia Purok I-B, Talacogon (F.F.)	April 30, 1998	7.9	5	3.6		0.5	<0.50	200	0	
11	Zillovia Purok I-A, Talacogon (F.F.)	April 30, 1998	8.2	0	2.0		0.5	<0.50	Numerous	0	
12	Buena Gracia, Talacogon (L.II)	April 30, 1998	7.5	10	8.8		0.2	<0.50	1,700	8	
13	Buena Gracia, Purok Tumalihic, Talacogon	April 30, 1998	7.6	4	8.8		0.2	<0.50	Numerous	No detected	
14	Zillovia, Talacogon-1	April 30, 1998	8.5	2	4.3		0.5	<0.50	No detected	0	
15	Zillovia, Talacogon-2	April 30, 1998	8.1	2	5.0		0.2	<0.50	Numerous	3	
16	Don Alejandro, San Luis (F.F.)-1	April 30, 1998	7.1	0	1.4		0.2	0.11	Numerous	0	
17	Poblacion Bapnish, San Luis-1	April 30, 1998	7.4	0	0.0		0.3	0.30	No detected	0	
18	Poblacion, San Luis-2	April 30, 1998	7.5	0	2.4		0.3	0.28	Numerous	0	
19	Poblacion, Don Maxima, San Luis-1	April 30, 1998	7.3	0	1.6		0.2	0.07	Numerous	0	
20	Poblacion, Purok 8, San Luis	April 30, 1998	7.2	107	1.4		0.3	0.28	300	0	
21	Don Alejandro, San Luis-2	April 30, 1998	7.0	0	0.2		0.7	0.44	Numerous	0	
22	Poblacion, Don Maxima, San Luis-2	April 30, 1998	7.5	27	0.9		0.1	0.08	Numerous	0	
23	Poblacion, Purok 4, San Luis	April 30, 1998	7.1	10	9.5		0.2	0.11	Numerous	0	
24	Dona Flavia, San Luis-1	April 30, 1998	7.5	0	1.5		0.3	0.20	0	0	
25	Dona Flavia, San Luis-2	April 30, 1998	7.4	21	0.2		0.1	0.10	0	2	
26	Patiny Purok 3, Prosperidad	May 16, 1998	7.3	N.A.	2.8		0.1	0.09	300	0	
27	San Teodoro, Binahanan, Bunawan-1	May 16, 1998	7.3	N.A.	0.5		0.1	0.09	0	0	
28	San Teodoro, Bunawan-2	May 16, 1998	6.6	N.A.	1.9		0.1	0.06	900	0	
29	San Teodoro, Bunawan-3	May 16, 1998	7.1	N.A.	4.2		0.3	0.05	2,000	2	
30	Esperanza Water District (L.III)	May 16, 1998	6.4	N.A.	3.4	0.04	0.2	0.10	400	0	
31	Labao, Esperanza	May 16, 1998	6.3	N.A.	74.0		0.4	0.30	400	3	

Note. N.A.: Not available











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