Report and Recommendation of the President to the Board of Directors

Project Number: 41913
August 2007

Proposed Loan
Republic of Indonesia: West Jakarta Water Supply Development Project

In accordance with ADB's public communications policy (PCP, 2005), this abbreviated version of the RRP excludes confidential information and ADB's assessment of project or transaction risk as well as other information referred to in paragraph 126 of the PCP.

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 10 June 2007)

Currency Unit	–	rupiah (Rp)
Rp1.00	=	$0.00011
$1.00	=	Rp9,103

ABBREVIATIONS

ADB	–	Asian Development Bank
EBITDA	–	earnings before interest, tax, depreciation, and amortization
EIRR	–	economic internal rate of return
EMS	–	environmental management system
MDG	–	Millenium Development Goal
NGO	–	nongovernment organization
PALYJA	–	PT PAM Lyonnaise Jaya
PAM Jaya	–	Perusahaan Daerah Air Minum Jakarta Raya
PDAM	–	Perusahaan Daerah Air Minum (public water utility)
SUEZ	–	SUEZ Group of France
TA	–	technical assistance

WEIGHTS AND MEASURES

km	–	kilometer
m	–	meter
m^3	–	cubic meter
m^3/s	–	cubic meters per second

NOTES

(i) The fiscal year (FY) ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends.

(ii) In this report, "$" refers to US dollars.

Vice President	L. Jin, Operations Group 1
Director General	R. Bestani, Private Sector Operations Department (PSOD)
Director	J. Yamagata, Infrastructure Finance Division 2, PSOD
Team leader	L. Shen, Investment Specialist, PSOD
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	N. Soewarno, Investment Officer, Indonesia Resident Mission, SERD

CONTENTS

LOAN AND PROJECT SUMMARY

Borrower	PT PAM Lyonnaise Jaya (PALYJA)
Classification	Targeting classification: Targeted intervention supporting the Millennium Development Goals (MDGs) Sector: Water supply, sanitation, and waste management Subsector: Water supply and sanitation Themes: Environmental sustainability, private sector development, inclusive social development Subthemes: Urban environmental improvement, public-private partnerships
Environmental and Social Assessment	The Project is classified as environment category FI. An environmental and social safeguard assessment of PALYJA's current operations was conducted. The involuntary resettlement classification is category B. Land acquisition and resettlement activities are minimal. The indigenous peoples classification is category C. The Project will not impact any communities of indigenous people.
Proposed Loan	An Indonesian rupiah-denominated loan of up to Rp455 billion with a maturity of up to 10 years, without Government guarantee. The Asian Development Bank (ADB) will charge an interest rate to be determined according to procedures applicable to ADB local currency loans for private sector operations, as well as a commitment fee and front-end fee to be approved by ADB's Credit Enhancement and Pricing Committee. The loan is funded through a local currency bond issued by ADB for this financing.
Borrower Description	PALYJA is a subsidiary company of SUEZ Environment, part of the SUEZ Group (SUEZ) of France, and is one of the largest water service providers in Indonesia. Following an equity sale by SUEZ Environment in July 2006, PALYJA is 51% owned by SUEZ Environment, 30% by the Indonesian group PT Astratel Nusantara, and 19% by Citigroup Financial Products Incorporated. In June 1997, PALYJA entered into a 25-year concession agreement with Perusahaan Daerah Air Minum Jakarta Raya (PAM Jaya), under which PALYJA took responsibility for the production and distribution of clean water in West Jakarta. The agreement became effective on 1 February 1998. Under the agreement, PALYJA is responsible for the design, construction, refurbishment, and operation of the water supply system; technical and quality control; human resources and training; financing of new works; and billing and collection. PALYJA operates (i) three water treatment plants: Pejompongan I and II , Cilandak South, and Taman Kota North; and (ii) more than 5,000

kilometers (km) of primary, secondary, and tertiary water supply networks.

Since 1998, PALYJA has invested more than Rp1 trillion ($109.8 million) in the water systems of West Jakarta, mainly to (i) improve the quality of delivery services, (ii) rehabilitate existing distribution networks, and (iii) expand distribution networks to increase the service coverage area.

Project Description

The loan will fund a portion of PALYJA's capital expenditure program for the third 5-year period of the concession between 2008 and 2012. The program will focus on improving service to existing customers and extending service delivery to new customers by (i) completing the production facility upgrade program begun in 1998; (ii) reinforcing, rehabilitating, and extending the existing distribution network; (iii) reducing unaccounted for water; and (iv) rehabilitating existing connections and implementing new connections.

Development Impact

First, the Project supports the Government's efforts to meet the target of the Millennium Development Goals (MDGs) through provision of much-needed water supply infrastructure. The consistent provision of clean water in West Jakarta will contribute to Indonesia's overall efforts to reach the MDGs by (i) reducing the proportion of people without access to safe drinking water (MDG 7), and (ii) improving the quality of human resource development and the environment by promoting healthy lifestyles and reducing mortality. Second, through assistance to PALYJA in developing its capital expenditure program, the Project will help the people of West Jakarta gain access to more consistent and affordable water supply, especially for low-income households. Third, the Project complements ADB public sector efforts to improve the legal framework in the water sector as well as policy dialogue with the Government on overall water sector management and improvement. For instance, the proposed Integrated Citarum Water Resource Management Project will help improve the upstream raw water supply system. Fourth, ADB involvement in PALYJA, through its public-private partnership model, will allow it to observe and raise issues with the Government on key policy and regulatory challenges. Finally, by using locally raised funds, the Project will have a positive impact on the development of local capital markets.

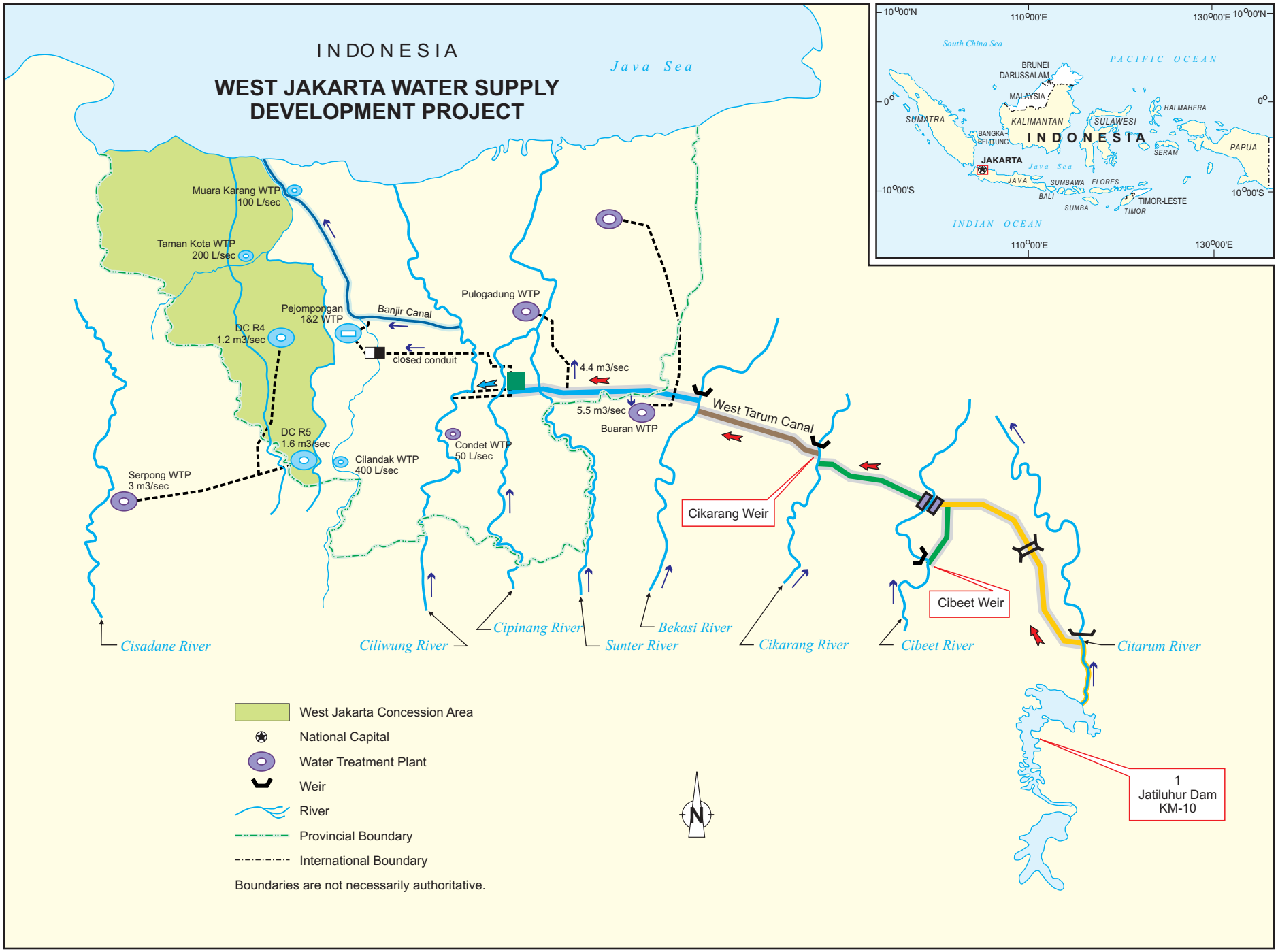
Project Risks

The main risks associated with the Project are (i) exposure to possible raw water supply interruptions due to inadequate maintenance of the West Tarum Canal, (ii) timely adjustment of the water tariff and water charge, and (iii) management of unaccounted for water. These risks have been or will be systematically addressed and mitigated.

Justification

The Project merits ADB support because it will help the

Government achieve poverty reduction and infrastructure development objectives. PALYJA will be in a position to comfortably fund its proposed capital expenditure program, a key component to expand water supply coverage in West Jakarta. The delivery of services to a broader customer base will lead to increased revenue, and reinforce PALYJA's financial sustainability and continuous operations through the life of the concession. Considering a broader scope, development effectiveness is reflected in the establishment of a well-maintained and efficient water supply system in West Jakarta.


INDONESIA
Java Sea
WEST JAKARTA WATER SUPPLY
DEVELOPMENT PROJECT
Muara Karang WTP
100 L/sec
Taman Kota WTP
200 L/sec
Pejompongan
1&2 WTP
DC R4
1.2 m3/sec
Banjir Canal
closed conduit
Pulogadung WTP
4.4 m3/sec
5.5 m3/sec
Buaran WTP
West Tarum Canal
DC R5
1.6 m3/sec
Cilandak WTP
400 L/sec
Condet WTP
50 L/sec
Serpong WTP
3 m3/sec
Cikarang Weir
Cibeet Weir
Cisadane River
Ciliwung River
Cipinang River
Sunter River
Bekasi River
Cikarang River
Cibeet River
Citarum River
1
Jatiluhur Dam
KM-10
West Jakarta Concession Area
National Capital
Water Treatment Plant
Weir
River
Provincial Boundary
International Boundary
Boundaries are not necessarily authoritative.
N
10°00'N
110°00'E
130°00'E
South China Sea
PACIFIC OCEAN
BRUNEI
DARUSSALAM
MALAYSIA
SUMATRA
KALIMANTAN
SULAWESI
HALMAHERA
BANGKA
BELITUNG
INDONESIA
SERAM
PAPUA
JAKARTA
Java Sea
JAVA
SUMBAWA
FLORES
BALI
SUMBA
TIMOR-LESTE
TIMOR
INDIAN OCEAN
0°
10°00'S

07-1960 RM

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed Indonesian rupiah-denominated loan, without government guarantee, of up to Rp455 billion to PT PAM Lyonnaise Jaya (PALYJA) for the West Jakarta Water Supply Development Project. The design and monitoring framework is in Appendix 1.

II. RATIONALE: SECTOR PERFORMANCE, PROBLEMS AND OPPORTUNITIES

A. Performance Indicators and Analysis

1. Background

2. Indonesia, with its abundant rainfall, has about 6% of the world's fresh water resources. However the development of Jakarta's water supply network, originally built during the Dutch occupation, has not kept pace with the city's rapid growth. As a result, by 1991 only 45%[1] of Jakarta's residents had access to piped water. Numerous incidents were reported of people finding worms, sand, or even needles in Jakarta's piped water; water quality was barely acceptable.

3. Currently, 60% of Jakarta's residents have access to clean water. But to reach the Millennium Development Goal (MDG) target of reducing the proportion of people without access to safe drinking water and basic sanitation by half by 2015 (MDG 7, Target 10), approximately Rp66.4 trillion ($7.3 billion) will be needed for water services,[2] of which only 25% is expected to be provided by the Government. The remaining investment is targeted to be provided by the private sector.

4. Perusahaan Daerah Air Minum Jakarta Raya (PAM Jaya), a state-owned enterprise to provide water supply in Jakarta and established in 1977, was responsible for water supply and sewerage services in Jakarta until late 1997. Unit production costs and the tariff structure were both high compared with other Asian countries, but at the same time PAM Jaya could not sustain an efficient management or investment program to meet the needs of residents. In 1997, the right to operate the city's water supply system was offered to private enterprises under two separate concessions, one in West Jakarta and one in East Jakarta. In early 1998 after negotiating cooperation agreements with PAM Jaya, PT Thames Pam Jaya was appointed the operator for the East Jakarta concession and PALYJA for the West.

5. However, within 3 months of signing the cooperation agreement, Indonesia was affected by the Asian financial crisis. Economic and political turmoil resulted in PAM Jaya being unable to implement the negotiated tariff increases. Thus PALYJA's planned capital expenditure program was never fully implemented. In 2001, a renegotiated cooperation agreement was signed to resolve the issue of tariff adjustment and to create mitigation measures for any future tariff freezes. Through this process, two issues became clear to PALYJA: (i) availability of long-term local currency financing is crucial in meeting PALYJA's investment obligations under the cooperation agreement and mitigating foreign exchange risks; and (ii) government support and enforcement of water tariffs are essential to ensure the financial sustainability of the concession, and the economic sustainability of the water sector.

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[1] ADB. 1994. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Republic of Indonesia for the Capacity Building Project in the Water Resources Sector*. Manila.

[2] ADB, 2003. *Indonesia Country Report*, Kyoto Water Forum. Manila.

6. PALYJA first approached ADB in December 2006. In March 2007, PALYJA confirmed its keen interest in obtaining a long-term local currency loan facility from ADB to help meet its capital expenditure requirements for the next planning cycle (2008–2012).

2. The Water Sector

7. Water resource management is poor and water demand is only about 1.7% of potential total demand.[3] Water quality varies depending on the season, year, and factory discharges. Despite efforts for environmental cleanup, overall water quality is worsening. Flooding is common, largely due to human deforestation and poor agricultural practices. In addition, the urban population has grown at more than 4% annually over the past 10 years[4] compared with the national average population growth rate of 1.7% per annum over the same period. The country's urban population is projected to grow from the current 45% of the total population to 60% in 2015, and will double by 2025. Most public utilities are not equipped to handle such drastic growth in urbanization, in particular the water utilities.

8. At present, only about 40 million people, or 18% of the total population, are connected to piped water supply.[5] Even in urban areas only 39% of residents receive piped water. The remaining urban population depends on individual wells, small-scale providers, or water vendors; often at high cost. In rural areas, the situation is much worse. Only about 15% of rural households get drinking water from pipe or pump sources, with Perusahaan Daerah Air Minum (PDAMs), the public water utilities, accounting for about half of the supply. The majority of rural households still rely on shallow groundwater extraction or rainwater collection, or use surface water from nearby rivers or springs. The poor are affected most by these situations.

9. It is estimated that a total investment of Rp66.4 trillion ($7.3 billion) will be needed for water services to achieve the MDG for water supply and sanitation by 2015[6]. This will require an annual spending on water services of about Rp5.1 trillion ($573 million) (para. 3). As compared with average government spending of Rp11 trillion each year on infrastructure, which includes roads, bridges, irrigation, water, housing, and others; public expenditure alone will obviously not be sufficient to address the water sector needs.

10. Before 1999, the central Government financed all public utility investments through grants, subsidies, or loans to the regional governments. Upon issuance of Law No. 22 of 1999 on Regional Governance, authority for all aspects of local infrastructure and service delivery, including planning, providing, financing, and managing water supply and sanitation, was devolved from the central Government to district and city governments (kabupaten and kota).

11. After decentralization, the bulk of financing responsibilities for water supply rested with the PDAMs. However, many PDAMs throughout Indonesia are unable to provide minimum services to consumers and are financially unsustainable due to inadequate tariffs. Further, the lack of financial sustainability has resulted in heavy debt obligations incurred by the PDAMs to the central Government amounting to $500 million, on top of other forms of external and commercial debt. A detailed summary of the water sector is attached as Appendix 2.

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[3] Under the scenario that water management is better coordinated and supply of water is better channeled.
[4] United Nations. 2004. *United Nations Human Settlements Indicators*.
[5] ADB. 2004. *Asia Water Watch 2015*. Manila.
[6] ADB. 2003. *Indonesia Country Report.* Manila. (Kyoto Water Forum)

a. Sector Policies and Regulations

12. The basis for the legal structure relating to water in Indonesia is found in Article 33 of the 1945 Constitution, which refers to land, water, and natural resources as "controlled by the State and utilized for the benefit of the people." Subsequently, Law 11 of 1974 (Law 11/74) gives the Government the authority to manage, develop, regulate, and supervise the use of water and water sources. Government regulation 22 of 1982 (GR 22/82) is the implementing regulation of Law 11/74, expanding on the management and planning functions of the Government and establishing the authority of the Ministry of Public Works to coordinate overall management of water and water resources. Regulation GR 22/82 allows the ministry to delegate its authority and functions relating to water and water resources to the regional governments. The ability of regional governments to set up PDAMs is set out in Law 5/74 and recently again in Law 22/99, a major directive to support the trend to decentralization to the 36 provinces.

13. A national water resources policy action plan was developed in 1994 for PJP II[7] to set the medium-term strategy and action items for the water sector, including (i) improvement of water resources development and productivity through increase in efficiency and effectiveness of water resources infrastructure; and (ii) increase in the supply of water and the productivity of water supply infrastructure to meet the requirements of urban and rural populations. Subsequently, the Water Resources Law 7/2004 and Government Regulation 16/2005 on Water Supply enhanced the legal framework for water supply by (i) clarifying the terms for private sector participation and hence ending public monopolies in the water sector, (ii) eliminating the need for local parliament approval of water tariff increases, and (iii) calling for the establishment of the National Water Regulatory Agency NWRA.

b. Sector Challenges

14. The key issues affecting Indonesia's water sector are (i) low service coverage with piped water supply, (ii) financially unsustainable water supply services, and (iii) lack of sanitation services.

15. **Low Service Coverage with Piped Water Supply.** Lack of access to water has a major impact on economic development, health, and well-being of the population. Many of the PDAMs throughout Indonesia are barely able to provide minimum services to consumers and have connected only about 39% of the urban population to piped water supply. As a result, more than 70% of the population obtains water from potentially contaminated sources. Unsafe drinking water leads to diarrhea, which is the second leading cause of death of children under 5 years in the country and accounts for about 20% of child deaths each year.

16. **Unsustainable Financing of Water Supply Services.** The widespread lack of cost recovery tariffs, compounded by the limited size of PDAMs and low revenue collection, have resulted in the reduction or abandonment of maintenance and investment activities, deteriorating assets, as well as low service coverage and quality. Of the 318 PDAMs, 82% are experiencing losses and 44% are operationally unsustainable. Of these, 119 PDAMs have foreign debts, while 146 PDAMs have domestic debt.[8]

17. **Lack of Sanitation Services.** Poor sanitation services impact negatively on public health and the well-being of the population. The high incidence of waterborne diseases is a

[7] The Government of Indonesia follows 5-year development plans known as Repelita and 25-year long-term development plans known as PJP. PJP II covers 1994–2019.

[8] Government of Indonesia. 1999. *PDAM Performance Assessment Guidelines, Home Ministerial Decree No.47/1999*. Jakarta.

potent indicator of the problems in the sector. Every year, at least 300 of 1,000 Indonesians suffer from waterborne disease, including cholera, dysentery, and typhoid fever, according to the Ministry of Health. Formal sewerage systems in Indonesia have been constructed in selected areas of a few large cities, but most are underutilized and underfunded, and therefore unable to realize the planned benefits of these systems. Overall, sewerage coverage is about 3% of the urban population. The vast majority of citizens still rely on on-site sanitation (e.g., septic tanks and pit latrines), while many low-income families rely on grossly polluted drains and urban waterways.

B. ADB Operations

1. Country Strategy

18. In developing its Medium-Term Development Plan (2005–2009)[9], the Government was guided by the objectives of increasing sustainable economic growth, creating jobs, and accelerating achievement of the MDGs. Under the plan, the Government's five priority areas are (i) job creation and poverty reduction; (ii) macroeconomic stability, fiscal sustainability, and financial sector reforms; (iii) acceleration of investments, exports, and tourism through reforms to provide a healthy business climate and flexible markets; (iv) improved access to and quality of education and health; and (v) infrastructure development by improving the efficiency of existing services and increasing private sector participation. To support the Government in achieving these goals, ADB's country strategy (2006–2009) reflects these priorities. Accordingly ADB plans to focus on (i) infrastructure development, (ii) financial sector deepening, (iii) decentralization, (iv) MDG acceleration, and (v) environment and natural resource management. This Project is in line with focus areas (i), (iv), and (v) of the strategy.

2. Water Sector Strategy

19. ADB's water sector strategy aims to promote (i) national focus on water sector reforms, (ii) development of integrated management of water resources, (iii) improvement and expansion of water delivery services, (iv) conservation of water and improvement of system efficiencies, (v) regional cooperation on water resource sharing, (vi) facilitation of water sector information exchange, and (vii) governance enhancements. The Project is in line with (iii) and (iv) of this strategy.

20. Water resource management is a key element of ADB operations for environment and natural resource management in Indonesia. Through the Infrastructure Reform Sector Development Program[10], key regulatory framework was defined for tariff and PDAM reforms. Based on this platform, support will be provided for integrated water resources management, including investments in infrastructure and management of multipurpose facilities, in the context of river basins. Two projects are under preparation. First, the Integrated Citarum Water Resources Management Project is being developed as a multitranche financing facility for approval in 2007. The Citarum project will help implement a strategic road map for development and sustainable management of the Citarum River basin, and thus improve water quality and supply to the cities of Jakarta and Bandung and to farmers in West Java. Second, the Flood Management in Selected River Basins Project, being developed as a multitranche financing facility for approval in 2008, will focus on selected river basins and improved capacities in Central and West Java. The Citarum project will enhance overall effectiveness of water resource and water supply management in Jakarta, which critically supports this Project.

[9] ADB. 2006. *Country Strategy and Program for Indonesia, 2006–2009*. Manila.
[10] ADB. 2006. *Infrastructure Reform Sector Development Program.* Manila.

Particular importance is placed on developing public and private sector dialogue and ensuring complementarity of the Project with public sector operations and overall water sector development strategy. Information on the Project is shared with the South East Regional Department, and close coordination will continue throughout development of the Project and development of various public sector initiatives.

21. ADB's Water Financing Program 2006–2010[11] also prioritizes Indonesia as one of its focal countries for expansion of water services. The program seeks to expand investments in three key areas: rural water services (water supply and sanitation, irrigation, and drainage), urban water services (water supply and sanitation, wastewater management, and environmental improvement), and basin water management (integrated water resource management, including investments in infrastructure, flood management, and water quality conservation; and conservation and improvement of watersheds, wetlands, and ecosystems). The Project is in line with the goals and objectives of the Water Financing Program, particularly with regard to investment in the urban water service sector.

3. Private Sector Operations

22. ADB's private sector operations in Indonesia aim to support the Government's Medium-Term Development Plan for economic growth and MDG acceleration. ADB is committed to utilizing its investment and cofinancing products, including equity, debt, and guarantees to assist Indonesia in mobilizing private sector investment in infrastructure and the financial sector.

23. Private sector operations began in Indonesia in 1985. During 1985–1998, ADB approved $197.5 million in financial assistance for 16 projects in the general industry and financial sectors. Some of these projects, particularly in manufacturing, performed less than satisfactorily primarily because of sector and partner selection issues. After the financial crisis, ADB did not provide new financial assistance to Indonesia until 2005, when it approved a liquefied natural gas project. In 2006, the ADB Board of Directors approved financial assistance to PT Perusahaan Gas Negara (Persero) Tbk, a state-owned gas utility. In 2007, the Board approved a loan to PT Semen Andalas Indonesia for the Reconstruction of the Cement Production Facility in Aceh. ADB's private sector projects in Indonesia are listed in Appendix 3.

24. ADB's long-term strategic framework recommends that ADB contribute to the development of local financial markets. The ADB paper *Introducing the Local Currency Loan Product*[12] proposes that ADB introduce a local currency loan product that would help reduce currency mismatches, promote capital market development, and catalyze local financing.

25. ADB's loan to PALYJA is proposed to be funded through the issue by the proceeds of a local currency bond, which would be the first local currency bond issued by ADB in Indonesia. If approved, the Project would be the first ADB local currency loan for a private sector infrastructure project in Indonesia.

III. THE BORROWER

A. Background

26. PALYJA is a subsidiary company of SUEZ Environment, part of the SUEZ Group (SUEZ) of France, and is one of the largest water service providers in Indonesia. In June 1997, PALYJA

[11] ADB. 2006. *Water Financing Program 2006–2010*. Manila
[12] ADB. 2005. *Introducing the Local Currency Loan Product.* Manila.

entered into a 25-year concession agreement (the cooperation agreement) with PAM Jaya under which PALYJA took responsibility for the production and distribution of clean water in West Jakarta. The agreement became effective on 1 February 1998. The scope of services includes the design, construction, refurbishment, and operation of the water supply system; technical and quality control; human resources and training; financing of new works; and billing and collection.

27. Since the start of the concession period in 1998, PALYJA has invested more than Rp1 trillion ($109.8 million) in the water systems of West Jakarta, mainly to (i) improve the quality of delivery services, (ii) rehabilitate existing distribution networks, and (iii) expand distribution networks to increase the service coverage area. Significant achievements include (i) service coverage ratio increased from 32% of the population in 1998 to about 55% in 2006; (ii) more than 1,500 kilometers (km) of the water supply network rehabilitated and extended; (iii) total connections increased from 210,000 in 1998 to 350,000 in 2006; (iv) population served increased by 1.25 million, including low-income customers increased by 124% and middle-income customers by 40%; (v) physical and commercial water losses reduced by 15%; and (vi) water quality compliance dramatically improved. A detailed description of PALYJA is attached as Appendix 4.

B. History of the Concession

28. Under the cooperation agreement, PALYJA is responsible for procurement of bulk water, operation of the water supply system, and billing and collection of water fees. To ensure the affordability of water to customers of all social economic classes, the agreement delinked water tariffs charged to customers (water revenue) and the revenues received by PALYJA (water charge). The water revenue would vary depending on the customer category, while PALYJA would receive a flat water charge for every cubic meter of water billed.

29. Within 3 months of signing the original agreement, Indonesia experienced the economic turmoil of the Asian financial crisis. As a result of political pressures arising from the crisis none of the increases in retail water tariffs envisioned in the agreement were implemented prior to 2000. Also, following the overthrow of the Suharto regime in 1998, the legitimacy of the two concessions were challenged. The Indonesian Government under President Habibie temporarily reclaimed the concessions under public authority. Control of the West Jakarta concession was returned to PALYJA, but with renegotiated terms and conditions.

30. In 2001, PAM Jaya and PALYJA finalized the terms of the renegotiated cooperation agreement, which sought to address the issue of the tariff freeze imposed prior to 2000 and established a regulatory body for mediation and monitoring. Pursuant to the renegotiated agreement, significant increases in water tariffs were implemented in 2001, 2003, and 2004 to bring water tariffs back in line with local inflation indices. In 2004, an amendment to the agreement introduced an automatic tariff adjustment mechanism that has been operating satisfactorily since early 2005.

C. Major Shareholders

31. Following a sale of equity by SUEZ Environment in July 2006, PALYJA is 51% owned by SUEZ Environment, 30% by the Indonesian group PT Astratel Nusantara, and 19% by Citigroup Financial Products Incorporated.

32. SUEZ is a France-based group listed on the Brussels, Luxembourg, Paris, New York, and Zurich stock exchanges. SUEZ is a provider of electricity, natural gas, energy services, water, and waste management. It has two main lines of business: energy and environment. The

energy business includes the production, sale, and trading of electricity; sale, trading, transport, and storage of natural gas; energy services, including on-site management on energy networks, and utilities and facilities management; as well as operation, maintenance, and development of power and natural gas distribution networks.

33. SUEZ Environment is responsible for supplying services, plant, and equipment for (i) drinking water production and distribution, (ii) wastewater collection and treatment, and (iii) waste processing and recycling to industrial and individual customers. SUEZ Environment is ranked second in environmental services in Europe for water and sanitation. To date, SUEZ Environment serves more than 400,000 industrial customers and 91 million individuals with drinking water, 49 million individuals with sanitation services, and 64 million individuals with waste services.

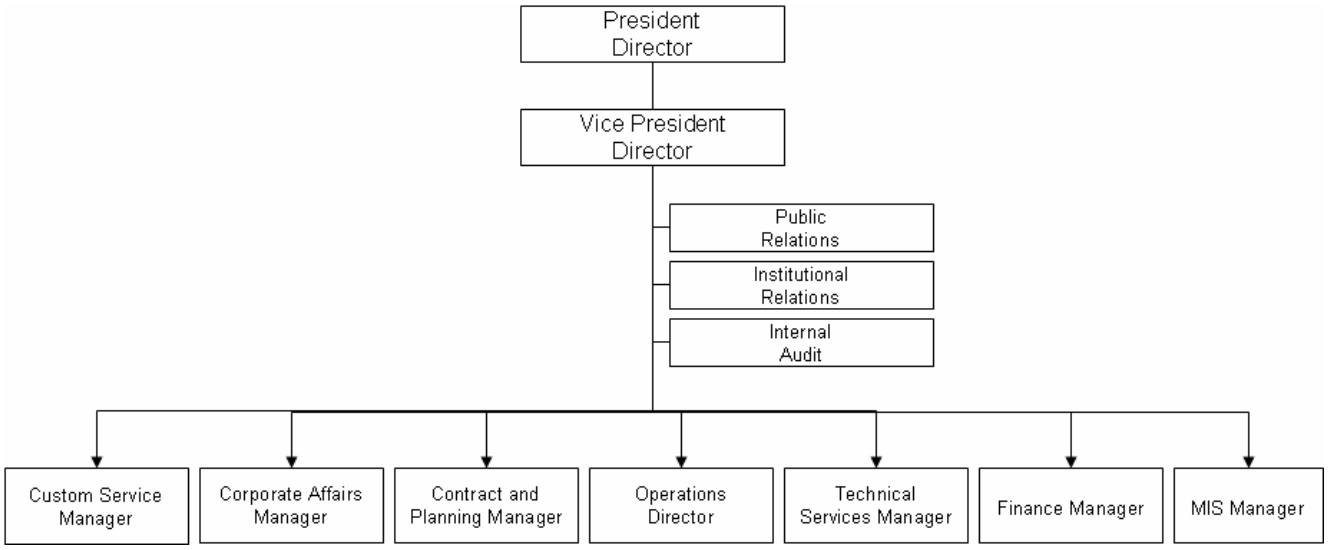
34. PT Astratel Nusantara (Astratel) is a subsidiary company under PT Astra International (Astra), an Indonesian conglomerate founded in 1957 and now one of the largest business groups in Indonesia. Astra currently has six core businesses: automotive, financial services, heavy equipment, agribusiness, information technology, and infrastructure. Astratel has been operating for 12 years and been involved in the development of numerous infrastructure projects, with a particular focus on telecommunications. Astratel now intends to actively pursue potential new infrastructure projects including water supply, toll roads, ports/logistics, marine facilities, and airports. Overall, Astra has adapted corporate governance standards according to international best practice, and internal policies are in place to ensure good corporate governance throughout the group and its subsidiaries. It was named the best listed company in the Jakarta Stock Exchange with regard to corporate governance, transparency, and accountability. In April 2007, Astra placed at the top of the *Finance Asia*[13] poll for Indonesia in the following three categories: (i) best managed company in Indonesia; (ii) most committed to corporate governance; and (iii) best investor relations.

D. Organization Structure

35. As of March 2007, PALYJA has 1,400 employees, of which 902 are employees seconded from PAM Jaya at the outset of the concession period. PALYJA is currently in the process of integrating seconded employees to become permanent employees, with the objective of enhancing employee equality and providing more flexibility with regard to labor management. The organization chart is presented in Figure 1:

[13] *Finance Asia.* 2007. Astra tops Indonesia Best Managed Companies Poll. 27 April.

Figure 1: PT PAM Lyonnaise Jaya Organization Chart



Source: PT PAM Lyonnaise Jaya.

E. Operations

36. PALYJA operates (i) four water treatment plants: Pejompongan I and II; Cilandak South; and Taman Kota North; and (ii) more than 5,000 km of primary, secondary, and tertiary water supply networks.

37. Sixty percent of PALYJA's water supplies are treated in the Pejompongan plants using water sourced from the West Tarum Canal system, which originates from Jatiluhur reservoir, 70 km southeast of Jakarta. The West Tarum Canal system is operated by Perum Jasa Tirta I, a state-owned company.

IV. THE PROJECT

38. The Project will fund part of PALYJA's capital expenditure program for the third 5-year concession period: 2008–2012.

A. Capital Expenditure Program

(i) Planned capital expenditure during 2008 to 2012 will focus on improving service to existing customers and extending service delivery to new customers by (i) completing the production facility upgrade program initiated in 1998; (ii) reinforcing, rehabilitating, and extending the existing distribution network; (iii) reducing unaccounted for water losses; and (iv) rehabilitating existing connections and implementing new connections.

B. Environment, Health, and Safety

1. Environmental Safeguards

39. The Project is classified as environment category FI. Due diligence was conducted on the environmental, safety, and health aspects of PALYJA's current operations to ensure compliance with ADB's safeguard policies. The environmental and social safeguard assessment for PALYJA is attached as Appendix 7. In addition, PALYJA will ensure that environmental monitoring for all future operations is undertaken in accordance with ADB's *Environment Policy* (2002). Hence, PALYJA will set up or improve environment management systems, including environmental assessment and review procedures satisfactory to ADB. PALYJA will also ensure it complies with Indonesian environment laws and regulations. PALYJA will confirm to ADB periodically its compliance with ADB and Indonesian environment requirements and make reports on these matters available to ADB.

2. Land Acquisition, Resettlement, and Indigenous Peoples

40. The Project is classified as category B for involuntary resettlement and category C for indigenous peoples. Due diligence was conducted on the social aspects of PALYJA's current operations, covering involuntary resettlement and indigenous peoples. With respect to PALYJA's planned capital expenditure program, land acquisition and resettlement activities are minimal. PALYJA has indicated its intention to avoid, if at all possible, land acquisition or other activities that would lead to involuntary resettlement. PALYJA will be required to ensure that any land acquisition and resettlement activities are undertaken in accordance with ADB's *Involuntary Resettlement Policy* (1995). A land acquisition and resettlement framework is attached as Appendix 8.

C. Projected Financial Performance

41. Detailed financial projections for PALYJA are provided in Appendix 9 and the financial analysis of the Project in Appendix 10. The main assumptions for the base case financial projections include (i) customer growth of 2% per annum; (ii) domestic inflation of 7% per annum; (iii) adjustment to the water charge based on the negotiated formula in the renegotiated cooperation agreement to reflect changes in capital expenditures and operating expenditures; and (iv) inclusion of labor-related costs (golden handshake, or else known as the retirement program, harmonization of benefits and salary) as per the cooperation agreement. The financial projections demonstrate PALYJA's ability to generate adequate cash flow to cover debt service

over the repayment period. The minimum projected debt service coverage ratio in the base case is 2.58 times, excluding the years where PALYJA has to fulfill its obligations in bond payments. Sensitivity analysis for debt servicing capacity shows that PALYJA will have adequate financial resources, even in a variety of downside scenarios (Appendix 9). Based on the financial analysis, the Project's financial internal rate of return is estimated at 12.8%, which is well above the estimated weighted average cost of capital of 4.19%.

D. Economic Evaluation

42. The Project has a strong economic rationale as it provides basic living conditions and assists in mitigating health hazards. The proposed actions under the Project represent technically feasible options at the least cost. The economic internal rate of return is 58.5% (Appendix 11). The sensitivity analysis on the various risk parameters indicates that the Project's economic internal rate of return is well above 30% under possible adverse circumstances. The health benefits of the Project and its contribution to conservation of the groundwater table and prevention of further subsidence of Jakarta are additional benefits that were not quantified in the economic analysis. These would strengthen economic returns from the Project.

V. THE PROPOSED ASSISTANCE

A. Description

1. Loan Nature and Amount

43. The proposal involves ADB providing PALYJA with an Indonesian rupiah-denominated loan of up to Rp455,000,000,000 with a maturity of up to 10 years, including a grace period of 5 years. The loan will be used to fund a portion of PALYJA's capital expenditure program for the third 5-year period of the concession between 2008 and 2012. To this end, the disbursement will be staggered over 3–4 years to best meet the needs of PALYJA. Detailed disbursement will be discussed in detail in the loan agreement. PALYJA's remaining capital expenditure funding requirement over the period will be met from internally generated cash flow. ADB will charge an interest rate to be determined according to procedures applicable to ADB local currency loans for private sector operations, as well as a commitment fee and a front-end fee to be approved by ADB's Credit Enhancement and Pricing Committee.

B. Justification

44. ADB assistance is justified for the following reasons:

(i) PALYJA's capital expenditure program will enhance and expand water supply infrastructure in West Jakarta, with a particular focus on increasing the number of low-income customers by expanding distribution networks in low-income areas, and will help meet the MDG target for water supply. ADB's long-term local currency assistance is expected to lead to improved affordability of water tariffs in Jakarta.

(ii) The Project is in line with the Government's objectives of increasing sustainable economic growth, creating jobs, and accelerating achievement of the MDGs.

(iii) The Project is in line with ADB's 2006–2009 country strategy and program for Indonesia, which outlines five key areas of engagement for ADB operations in

Indonesia, of which four are relevant in the context of the Project: (a) physical infrastructure development, (b) financial sector deepening, (c) MDG acceleration, and (d) environment and natural resource management. Further, the strategic focus for ADB in water supply, sanitation, and waste management is on improving local delivery of services.

(iv) The Project and ongoing ADB public sector projects are complementary. The improvement of upstream water supply by ADB public sector operations will greatly enhance the consistency of raw water supply for PALYJA, which intends to implement efficient water supply in Jakarta with ADB private sector assistance.

(v) Water supply, sanitation, and waste management remain an ADB priority, both in the short and medium terms. It is included as a first priority (group I) in both the current country strategy and ADB's Medium-Term Strategy II.[14]

(vi) The Project is in line with ADB's Water Financing Program 2006–2010, which focuses on the expansion of investments in water infrastructure and good governance in water resource management.

(vii) ADB assistance is demonstrational. It is expected to have a positive impact on PALYJA's future access to commercial funding in local and international capital markets. Funding of the local currency loan by ADB from the market should have a positive impact on the development of local capital markets as well.

C. Risks and Mitigation Measures

45. **Raw Water Supply.** As the majority of PALYJA's water supply originates from the Jatiluhur reservoir via the West Tarum Canal, PALYJA is exposed to possible water supply interruptions due to (i) inadequate maintenance and repair of the canal and associated pumping stations, and (ii) lack of management capacity at Perum Jasa Tirta II. Backup water supply sources are of lower quality, resulting in higher processing costs. However, overall raw water availability is adequate and the risk of short-term supply interruptions from the primary source is expected to be mitigated through the ADB public sector assistance for improving integrated water resource management in the Citarum Basin and assistance with capacity building for Perum Jasa Tirta II.

46. **Tariff Policy and Adjustment Risk.** The history of policy implementation and enforcement for PALYJA's water supply concession is marred. PALYJA depends heavily on the Government's regulatory framework and commitment to policy implementation. In the 1990s, previously agreed tariff adjustments had not been implemented due to political considerations, particularly in the aftermath of the Asian financial crisis, and as a result PALYJA has not always received the full amount it was entitled under the 1998 cooperation agreement. The Government's inability to implement tariff increases affected the ability of PALYJA to collect the necessary water charges to fund its capital expenditure program. Issues such as this will still have crucial implications for PALYJA's operating and financial standing. The tariff risk is mitigated through (i) establishment of the automatic tariff adjustment mechanism, which resolves the main concern for the lack of sufficient water revenue to cover the water charge; (ii) PAM Jaya using surplus revenues to repay amounts owed to PALYJA as a result of earlier failures to make tariff adjustments; (iii) ADB involvement in PALYJA as through its public-private

[14] ADB. 2006. *Medium-Term Strategy II, 2006–2008*. Manila.

partnership model, it will be able to observe and raise issues with the Government on key policy and regulatory challenges.

47. **Water Loss Risk.** While the water loss ratio has decreased from 62% to 47% since PALYJA took over operation of the West Jakarta water supply system, water loss remains a significant problem for PALYJA. The main causes of water loss are (i) an aging pipeline network with water loss through leakages, and (ii) high susceptibility to illegal connections in PALYJA's distribution network. PALYJA's ability to rehabilitate the pipeline network and to control illegal connections will have a direct impact on its financial performance. PALYJA's proposed 5-year capital expenditure program is designed to address these issues. ADB support for the program will help mitigate the risk of water loss.

D. Development Impact

48. First, the Project supports the Government's effort to meet the MDG target for water supply by providing much-needed water supply infrastructure. Second, through assistance to PALYJA in developing its capital expenditure program, the Project will help the people of West Jakarta gain access to more consistent and affordable water supply, especially for low-income households. Third, the Project complements ADB public sector efforts to improve the legal framework in the water sector as well as policy dialogue with the Government on overall water sector management and improvement. For instance, the proposed Integrated Citarum Water Resource Management Project will help improve the upstream raw water supply system. Fourth, the joint effort within ADB will also enhance the ability for PALYJA to gain access to additional private sector funds by way of demonstrating the positive influence ADB is expected to have on managing the Government's responsibilities with regard to public-private partnerships. Finally, by using funds raised in the local market, the Project will have a positive impact on the development of local capital markets.

E. Development Effectiveness

49. The development effectiveness of the Project is assessed in terms of private sector development, business success, and economic sustainability. At the company level, PALYJA will be in a position to comfortably fund its proposed capital expenditure program, a key component to expanding water supply coverage in West Jakarta. The delivery of services to a broader customer base will lead to increased revenue and reinforce PALYJA's financial sustainability and continuous operations through the life of the concession. On a broader level, the development effectiveness is reflected in the establishment of a well-maintained and efficient water supply system in West Jakarta. The impact of this can be observed during the life of the concession by assessing the quality of the distribution system. Further, the longer tenor offered by the ADB local currency loan, which is not available in the local market, will lead to less cost pass-through to the consumers as a result of smaller tariff increases, which will in turn lead to more accessibility and affordability of water. The impact can be measured through assessment of the growth rate in the number of customers and the comparative rate of increase of water tariffs.

F. Anticorruption Measures

50. PALYJA was advised of ADB's Anticorruption Policy (1998, as amended to date) and policy relating to the Combating of Money Laundering and the Financing of Terrorism (2003). Consistent with its commitment to good governance, accountability, and transparency, ADB will require PALYJA to institute, maintain, and comply with internal procedures and controls following international best practice standards for the purpose of preventing corruption, money

laundering, or the financing of terrorism, and covenant with ADB to refrain from engaging in such activities. The loan documentation between ADB and PALYJA will allow ADB to investigate any violation or potential violation of these undertakings

VI. EXPOSURE LIMITS

51. This investment will represent 1.53% of the total portfolio of ADB's Private Sector Operations Department, will increase ADB investment in the water supply and sanitation sector from 1.21% to 2.72%, and will increase ADB investment in Indonesia from 3.92% to 5.39%. The proposed assistance is within approved country and sector exposure limits.

VII. ASSURANCES

52. Consistent with the Agreement Establishing the Asian Development Bank, the Government will be requested to confirm that it has no objection to the proposed assistance to PALYJA. No funding will be disbursed until ADB receives such confirmation. ADB will enter into a suitable loan agreement and other required documents, following the approval of the proposed loan by ADB's Board of Directors. These agreements will be on terms and conditions satisfactory to ADB.

VIII. RECOMMENDATION

53. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and, acting in the absence of the President, under the provisions of Article 35.1 of the Articles of Agreement of ADB, I recommend that the Board approve the loan, without government guarantee, of up to Rp455,000,000,000 to PT PAM Lyonnaise Jaya (PALYJA) for the West Jakarta Water Supply Development Project from ADB's ordinary capital resources, with an interest rate to be determined based on procedures applicable to ADB local currency loans for private sector operations, and on such other terms and conditions as are substantially in accordance with those set forth in this report and as may be reported to the Board.

C. Lawrence Greenwood, Jr.
Vice President

8 August 2007

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets/Indicators	Data Sources/Reporting Mechanisms	Assumptions and Risks
Impact • Contribute to Indonesia achieving the Millennium Development Goals (MDGs) in (i) reducing the proportion of people without access to safe drinking water (MDG 7); and (ii) improving the quality of human resource development and the environment by promoting healthy lifestyles and reducing mortality.	• 50% reduction of people without access to safe drinking water in Indonesia	• Central and municipal government reports and statistics	
Outcome • The residents of Western Jakarta have increased access to safe and clean water at a reasonable cost, provided by a financially viable water utility	• 70% of the population connected to piped water • Quality of water supply meets (domestic) standard • PALYJA complies with financial covenants in loan agreement	• Municipal statistics • PALYJA customer data • Regional water statistics	• PALYJA can secure sufficient water supply to distribute to its customers • Government supports tariff increases and repays the revenue shortfall • PALYJA management ensures the financial soundness of the concession
Outputs • Rehabilitation of existing distribution network • Expansion and densification of water distribution network • Increase in end-user connections and meter installation • Reduction of unaccounted for water losses	• Length of distribution networks increased by 120 kilometers per annum from 2008 to 2012 • Number of connections increased by at least 65,000 by 2015 • Customer water usage increased by at least 2% per annum • Unaccounted for water decreased to at least 40% by 2015	• Periodic operating data by PALYJA • Domestic statistics on water supply • PALYJA financial reports	• PALYJA maintains technical and operating standards on the construction and rehabilitation of the water distribution network and facilities • Government supports the tariff increases and repays the revenue shortfall • Water demand is sufficient • Raw and bulk water supply is sufficient
Activities with Milestones **Investment Program for 2008–2012** 1. Primary extension of network in undeveloped areas in Western Jakarta 2. Primary rehabilitation of existing network 3. Distribution network extension in undeveloped areas 4. Distribution network rehabilitation 5. Unaccounted for water reduction for commercial and physical losses 6. Rehabilitation of connections 7. New connections 8. Metering for new residents and illegal users			**Inputs** • ADB local currency loan: $50 million • PALYJA: Balance of investment program

ADB = Asian Development Bank, PALYJA = PT PAM Lyonnaise Jaya.

THE WATER SECTOR

A. Water Resources and Watershed Management

1. Indonesia has some 500 rivers of substantial size that reach the sea and are grouped into river basin areas. The estimated water resources by island group are given in Table A2.1, which indicate that water demand is only about 1.7% of potential. Most of the demand is concentrated in Java or around urban areas in other islands where the demand/supply ratio is far more critical, especially during the dry season.

Table A2.1: Water Resources by Island

Island	Area ('000 km^2)	Surface Water Potential (m^3/s)	Ground Water Potential (m^3/s)	Low Flow Available (m^3/s)	Demand/Supply Ratio (1990) (m^3/s)			Storage Available (m^3/s)
					Irrigation	DMI	Total	
Java / Bali	139	6,199	95	786	950	124	1,074	245
Nusa Tenggara	81	1,777	21	90	70	3	73	—
Sumatra	470	23,660	n.a.	4,704	271	26	297	150
Kalimantan	535	32,279	n.a.	6,956	19	7	26	150
Sulawesi	187	2,488	44	561	120	6	126	—
Maluku	78	3,373	9	391	5	1	6	—
Irian Jaya	414	28,061	n.a.	4,140	2	1	1	—
Total	**1,904**	**97,837**	**169**	**17,628**	**1,437**	**168**	**1,603**	**545**

km^2 = square kilometer; m^3/s = cubic meters per second; DMI = domestic, municipal, industrial water, n.a. = not available.
Source: Directorate of Planning and Programming, Ministry of Public Works. 1990.

2. Water quality varies depending on the season (wet versus dry), year, factory discharges, and other factors. In many urban development areas the rivers are badly polluted. The Government, aware of the problem and of the need to clean up the environment, started a clean river program (Prokasih) in 1989.

3. The objective of Prokasih is to reduce the pollution load from industrial activities through a two-step process. In the first 5-year program, the Government conducted an inventory of industries; identified potential polluters; evaluated pollution control measures; and advised industries on wastewater treatment, effluent standards, and pollution control regulations. During the second 5 years, the offending industries entered into a commitment with local government to reduce pollution load, treat their discharges using the polluter pays principle, and pay fines imposed by the regional government. According to the follow-on Regulation 20/1990, each industry must monitor its discharges monthly and report these together with wastewater plant treatment performance to the provincial government. In reality, few industries comply with this regulation; most discharges do not conform to the prescribed standards; few sanctions or fines are imposed; and water quality continues to deteriorate.

4. Flooding occurs regularly throughout Indonesia and affects the water quality, particularly in the wet season. The incidence and extent of flooding vary according to rainfall profile and intensity, precedent soil saturation, ground permeability, and other factors. Human deforestation, poor agricultural practices, and extensive paving are increasing runoff from catchment areas. The impact of floods is worsened by the filling in of wetlands, clogging up of facilities, and

increased channel roughness due to slum housing and plantations along the banks. In addition to flooding, these conditions can create devastating landslides, mud flows, and seiches.[15]

C. Water Supply

5. Only 39% of the urban population and 15% of the rural population have access to adequate water supply. Water is supplied and distributed by different providers, depending on the area covered. The providers are (i) 318 PDAMs, generally supplying piped water; (ii) formal private sector; and (iii) small-scale private water providers, which make up the informal private sector. Tables A2.2 and A2.3 provide a summary of current and projected water supply by region and sector.

Table A2.2: Annual Water Supply (million cubic meters) in 2000

Region	DMI	River Maintenance	Irrigation	Fishpond	Livestock	Total
Java and Bali	6,141	7,203	36,607	805	212	50,968
Sumatra	1,465	1,767	14,662	1,257	98	19,249
Kalimantan	346	484	3,265	44	18	4,157
Sulawesi	441	506	8,266	753	75	10,041
Maluku and NusaTenggara	254	266	6,168	354	24	7,066
Irian Jaya	60	77	675	0	0	812
Indonesia	8,707	10,303	69,643	3,213	427	92,293

Source: Japan International Cooperation Agency. 1993. Formulation of Irrigation Development Program in Republic of Indonesia, draft final report.

Table A2.3: Projected Annual Water Supply (million cubic meters), 2020

Region	DMI	River Maintenance	Irrigation	Fishpond	Livestock	Total
Java / Bali	9,805	9,779	54,918	809	258	75,569
Sumatra	2,630	2,733	15,992	1,257	155	22,767
Kalimantan	768	820	3,643	753	29	6,013
Sulawesi	686	769	14,243	354	110	16,162
Maluku / NT	406	444	5,526	40	69	6,485
Irian Jaya	107	124	48	0	2	281
Indonesia	**14,401**	**14,670**	**94,370**	**3,213**	**623**	**127,277**

DMI = domestic, municipal, industrial, NT = Nusa Tenggara. .
Source: Japan International Cooperation Agency. 1993. Formulation of Irrigation Development Program in Republic of Indonesia, draft final report.

6. Before 1999, the central Government financed all public utility investments through grants, subsidies, or loans to the regional governments. Upon the issuance of Law No. 22 of 1999 on Regional Governance, the central Government devolved authority for all aspects of local infrastructure and service delivery, including planning, providing, financing, and managing water supply and sanitation, to district and city governments (kabupaten and kota).

[15] Seiches are river surges that usually result from large landslips causing a temporary dam in the river, or from the collapse of temporary logging dams.

7. After decentralization, the bulk of financing responsibilities for water supply rested with the PDAMs. However, many of the PDAMs throughout Indonesia are unable to provide minimum services to consumers and are financially unsustainable due to inadequate tariffs. Further, the lack of financial sustainability has resulted in heavy debt obligations incurred by the PDAMs to the central Government amounting to $500 million, on top of other forms of external and commercial debt.

8. To address the difficulties faced by PDAMs, the Indonesian House of Representatives approved the new draft law on water resources.[16] The law explicitly stipulates private sector participation in water supply services, thereby breaking the monopoly of the PDAMs. Specifically, the law provides clarity on the roles and responsibilities of regional governments, PDAMs, and private partners, as well as establishes the legal framework for use of water and resource protection. Water resource and river basin management was delegated to Perum Jasa Tirta I and Perum Jasa Tirta II, wastewater disposal and solid waste management to regional governments, and water supply provision to the PDAMs. If the PDAMs are unable to undertake the task themselves, the law stipulates that they should delegate the task to other business entities and the private sector.

9. The water resources law also requires the establishment of a national regulator for water supply and sanitation, which is to function independently. Establishment of the regulator is intended to maintain the balance of interests among the governments, operators, and consumers. The regulator is anticipated to be instrumental in creating an enabling environment for private sector participation, and to help set standards on operating and financial performance for the PDAMs. In summary, measures to improve PDAM efficiency and financial and operating performance include (i) imposing cost-recovery tariffs, (ii) improving revenue collection, (iii) enhancing financial management and accounting, (iv) reducing nonrevenue water, (v) expanding coverage with service connections, and (vi) improving customer orientation.

D. Wastewater Management and Sanitation

10. The primary goal of sanitation, public health, and wastewater management is to provide the rural and urban populations with facilities for the safe, efficient, and sustainable collection and disposal of wastewater, thereby producing a clean and healthy living environment in households and neighborhoods.

11. Wastewater management comprises two distinct services. The first involves removing wastewater from the point of generation to provide households with a clean and healthy living environment. The second comprises collecting sewage from the point of generation and conveying it away from the living environment for treatment and disposal in a way that does not pollute the environment. In urban areas, these functions are performed by urban public wastewater services: sewerage and sewage treatment plants. In rural areas, the function is performed by toilets connected to septic tanks, where sewage can be denatured and rendered for agricultural use or disposal.

12. Urban sewerage coverage in Indonesia is low, with only seven cities having some kind of partial network. Most people rely on on-site sanitation facilities such as septic tanks. However, sewage collection and disposal is generally inadequate, and most sewage still ends up in rivers or canals. Widespread contamination of surface water and groundwater has resulted in recurrent epidemics and a high incidence of waterborne diseases as well as environmental impact.

[16] Water Resources Law 7/2004, approved February 2004.

13. Rural households mainly rely on self-provision through shallow groundwater abstraction, rainwater collection, or use of surface water from nearby rivers and springs. Only about 27% of rural households claim to regularly use toilet facilities. Community-managed systems serve about 30% of the rural population, mostly through their own efforts or with the support of national and/or donor-funded initiatives. The lack of sufficient access to wastewater management and available facilities leads to increasing risks of diarrhea, intestinal worms, skin disease, and other water-related diseases such as malaria and dengue.

1. Key Challenges

14. The key issues affecting Indonesia's water sector are (i) low service coverage with piped water supply, (ii) financially unsustainable water supply services, and (iii) lack of sanitation services.

a. Low Service Coverage with Piped Water Supply

15. Lack of access to water has a major impact on economic development, health, and well-being of the population. Many of the PDAMs throughout Indonesia are barely able to provide minimum services to consumers and have connected only about 39% of the urban population to piped water supply. As a result, over 70% of the population obtains water from potentially contaminated sources. Unsafe drinking water leads to diarrhea, which is the second leading cause of death of children under 5 years of age in the country and accounts for about 20% of child deaths each year.

b. Unsustainable Financing of Water Supply Services

16. The widespread lack of cost recovery tariffs, compounded by the limited size of the PDAMs and low revenue collection, has resulted in reduced or abandonment of maintenance and investment activities, deteriorating assets, as well as low service coverage and quality. Of the 318 PDAMs, 82% are experiencing losses and 44% are operating unsustainably. Of these, 119 have foreign debt and 146 have domestic debt.[17]

c. Lack of Sanitation Services

17. Poor sanitation services impact negatively on public health and the well-being of the population. The high incidence of waterborne diseases is a potent indicator of the problems in the sector. Every year, at least 300 of 1,000 Indonesians suffer from waterborne disease, including cholera, dysentery, and typhoid fever, according to the Ministry of Health. Formal sewerage systems in Indonesia have been constructed in selected areas of a few large cities, but most are underutilized and underfunded, and therefore unable to realize the planned benefits of these systems. Overall, about 3% for the urban population is connected to sewerage. The vast majority of citizens still rely on on-site sanitation (e.g., septic tanks, and pit latrines), while many low-income families rely on grossly polluted drains and urban waterways.

E. History of Water Supply in Jakarta

18. The water supply system in Jakarta originally started in 1920 under the Dutch through a combination of deep wells and springs. As the city grew, demand for water also increased and led to the construction of new water treatment/supply facilities with state, bilateral, and multilateral assistance. The first large water treatment plant in Jakarta, Pejompongan I (2 cubic meters/second [m^3/sec]), was built in 1953 and the Pejompongan II water treatment plant (3 m^3/sec) in 1964. In the 1980s, during great urban and industrial development in Jakarta,

[17] PDAM Performance Assessment Guidelines, Home Ministerial Decree No.47/1999.

two water treatment plants, Pulogadung (4 m^3/sec) and Buaran (5 m^3/sec) were built. In addition, seven smaller water treatment plants (<0.2 m^3/sec) began operating before 1997.

19. Jakarta's raw water supply mostly comes from surface water, of which 80% is from the Citarum River, located east of Jakarta. The water is managed through several dams, including the Saguling, Cirata, and Jatiluhur dams. These dams are also used for electric power generation, river flow management, irrigation, tourism, and industrial purposes. The water is channeled for distribution through the West Tarum Canal. Another 15% comes from the Cisadane River, west of Jakarta; the remaining 5% comes from smaller rivers flowing from West Java Province to the Jakarta area, such as the Ciliwung, Krukut, and Pesanggarahan rivers.

20. In 1968, PDAM Jakarta was separated from the Ministry of Public Works, and in 1977, the Jakarta Water Supply Enterprise, Perusahaan Daerah Air Minum Jakarta Raya (PAM Jaya) was established to replace PDAM Jakarta as the provider of water supply and sewerage services for Jakarta.[18]

21. Due to the lack of discipline and monitoring, extension of services for production capacity and distribution to end users were not ideal. By 1997, water supply infrastructure was characterized by old and rusted pipes, bad connections, damaged valves, and groundwater intrusion resulting in decreased water pressure in customers' taps. Unaccounted for water was around 57% due to illegal connections, physical losses, and meter tampering.

22. In 1994, the Jakarta city government developed a master plan to improve access to drinking water for the population of Jakarta. By 2019, 83% of Jakarta was expected to have access to drinking water. To achieve this goal, the key activities included (i) establish new water treatment plants, (ii) expand and build new pipeline systems, (iii) rehabilitate damaged pipelines, (iv) increase the number of connections, (v) increase water pressure and (iv) decrease unaccounted for water.

23. To accelerate the improvement of water delivery service and to accommodate the redirection of government policy in infrastructure development from public financing to private financing, private sector participation was encouraged. As a result, PAM Jaya entered into 25-year concession agreements with two private operators, effective from February 1998, with Suez Lyonnaise des Eaux (PT Pam Lyonnaise Jaya) and Thames Water International (PT Thames Pam Jaya), to serve the western and eastern parts of Jakarta respectively.

[18] Regional Government Regulation No. 3/1977.

ASIAN DEVELOPMENT BANK PRIVATE SECTOR OPERATIONS IN INDONESIA

($'000)

Investment No.	Company	ADB Loan	Equity Investment[a]	Guarantee	CFS	Combined Total	Date of Approval
Under Administration							
7039/979	PT BBL Danatama Finance	15.000	–	–	–	15.000	26-Oct-89
7054/1023	PT Bakrie Finance Corp.	15.000	1.250	–	–	16.250	09-Aug-90
7068/1083	PT Seamless Pipe Indonesia Jaya	15.000	5.000	–	–	20.000	28-May-91
7224/2214	HSBC Bank USA, National Association[b]	350.000	–	–	–	350.000	14-Dec-05
7239	Deutsche Bank AG	–	0.200	9.800	–	10.000	26-Jul-06
7243/2251	PT Perusahan Gas Negara (Persero) TBK	75.000	–	–	125.000	200.000	10-Aug-06
7252/2325	PT Semen Andalas Indonesia	45.000	68.000	–	45.000	158.000	16-Mar-07
Divested, Written Down, and Fully Repaid							
7005	PT Kratama Belindo Int'l	–	0.400	–	–	0.400	25-Jun-85
7026/905	PT Gunung Garuda	15.000	–	–	–	15.000	27-Sep-88
7029	PT Bank UPPINDO	–	1.675	–	–	1.675	17-Nov-88
7038/978	PT Mediasarana Multi Finance	5.000	0.339	–	–	5.339	26-Oct-89
7044	PT Asian Development Securities Co.	–	1.186	–	–	1.186	19-Dec-89
7045	PT Indonesia Development Fund Ltd.	–	6.000	–	–	6.000	19-Dec-89
7088/1227	PT Wiraswata Gemilang	17.000	1.500	–	–	18.500	22-Apr-93
Canceled							
7004	Bank Pembangunan Indonesia (BAPINDO)	–	1.000	–	–	1.000	25-Jun-85
7030	BAPINDO II	–	5.000	–	–	5.000	29-Nov-88
7073/1119	PT Ispat Steel	30.000	7.500	–	–	37.500	19-Nov-91
7100/1284	PT Sunnymas Prima Agung	9.000	2.000	–	–	11.000	07-Dec-93
7129/1496	PT Banjarmasin Agrojaya Mandiri	32.500	8.125	–	–	40.625	28-Nov-96
7148	Secondary Mortgage Facility	–	3.000	–	–	3.000	25-Jun-98

ADB = Asian Development Bank, CFS = complementary financing scheme.

[a] Equity investment includes direct equity investment, line of equity, and underwriting.

[b] Tangguh liquefied natural gas project.

Source: Asian Development Bank.

PT PAM LYONNAISE JAYA: DESCRIPTION AND HISTORY OF CONCESSION

1. PT PAM Lyonnaise Jaya (PALYJA) is a subsidiary company of SUEZ Environment of France and is one of the largest water service providers in Indonesia. PALYJA entered into a 25-year cooperation agreement with the Government commencing 1 February 1998. The scope of services under the agreement includes the design, construction, refurbishment, and operation of the water supply system; technical and quality control; human resources and training; financing of new works; and billing and collection. Following an equity sale by SUEZ Environment in July 2006, PALYJA is 51% owned by SUEZ Environment, 30% by the Indonesian group PT Astratel Nusantara, and 19% by Citigroup Financial Products Incorporated.

2. Since the start of the concession period in 1998, PALYJA has invested more than Rp1 trillion (equivalent to $109.8 million) in the water systems of West Jakarta, mainly to (i) improve the quality of delivery services, (ii) rehabilitate existing distribution networks, and (iii) expand distribution networks to increase the service coverage area. Significant achievements include (i) increase in the service coverage ratio from 32% of the population in 1998 to about 55% in 2006; (ii) rehabilitation and extension of the water supply network for more than 1,500 kilometers (km); (iii) increase in total connections from 210,000 in 1998 to 350,000 in 2006; (iv) increase in the population served by 1.25 million, including a 125% increase in low-income customers and a 40% increase in middle-income customers; (v) 15% reduction in physical and commercial water losses; and (vi) dramatic improvement in water quality compliance.

A. Major Shareholders

1. The SUEZ Group

3. SUEZ SA (SUEZ) is a France-based group listed on the Brussels, Luxembourg, Paris, New York, and Zurich stock exchanges. The group is a provider of electricity, natural gas, energy services, water, and waste management. SUEZ has two main line of business: SUEZ Energy and SUEZ Environment.

4. SUEZ Energy covers the production, sale, and trading of electricity; sale, trading, transport, and storage of natural gas; energy services, including on-site management of energy networks and utilities; facilities management; as well as operation, maintenance, and development of power and natural gas distribution networks. SUEZ Environment covers the production, treatment, and distribution of drinking water; rainwater collection and treatment; waste collection, processing, and recycling; and rehabilitation of polluted industrial sites.

5. SUEZ has more than 157,000 employees and provides more than 200 million individuals, 3,000 municipalities, and 500,000 industrial clients around the world with clean energy, treated water, and environment-friendly waste services. As of 30 April 2007, SUEZ Group's long-term shareholders are Groupe Bruxelles Lambert (9.6%), Groupe Credit Agricole (3.4%), employee shareholder plan (3%), Groupe CDC (2.8%), Areva (2.2%), CNP Assurances (1.6%), Sofina (1.2%), and Treasury stock (0.4%). In 2006, SUEZ Group achieved 8.2% growth and revenues of €44.3 billion. Key figures of the SUEZ Group financial statements (as prepared by the SUEZ Group in accordance with French generally accepted accounting principles are provided in Table A4.1.

Table A4.1: SUEZ Group Financial Highlights
(€ million)

Item	2006	2005
Income Statement		
Income from operating activities	6,383	1,218
Exceptional income (loss)	401	(355)
Income tax, profit sharing, and incentive schemes	186	137
Net income	6,970	1,000
Cash Flow Statement		
Cash flow from operating activities	2,513	395
Of which gross cash flow	2,583	452
Cash flow from (used in) investing activities	(11,439)	(7,260)
Cash flow from (used in) financing activities	7,381	6,467
Balance Sheet		
Property, plant, equipment, and intangible assets	16	14
Financial assets	48,039	36,245
Prepaid expenses and other current assets	315	295
Marketable securities, cash, and cash equivalents	217	75
Total Assets	48,587	36,629
Shareholders' equity	31,723	25,847
Provisions	244	350
Borrowing and long-term debt	16,480	10,224
Deferred income and other liabilities	140	208
Total Liabilities and Shareholders' Equity	48,587	36,629
Key Financial Ratios		
Return on Assets	13%	10.7%
Return on Equity		
Debt to Assets	46.3%	73.4%
Corporate Rating		
Moody's	A2	A2
Standard & Poor's	A–	A–

Source: SUEZ 2006 Annual Report, SUEZ Environment / PALYJA data.

6. SUEZ Environment is responsible for supplying services, plant, and equipment for (i) drinking water production and distribution, (ii) wastewater collection and treatment, and (iii) waste processing and recycling to industrial and individual customers. SUEZ Environment is ranked second in environmental services in Europe in water and sanitation. To date, SUEZ Environment serves more than 400,000 industrial customers and 91 million individuals with drinking water, 49 million individuals with sanitation services, and 64 million individuals with waste services.

7. In water services, SUEZ Environment has a wide portfolio from water production to wastewater treatment and sanitation. Subsidiaries include Lyonnaise des Eaux (France), Eurawasser (Germany), Agbar (Spain), LYDEC (Morocco), United Water (United States), Acque Toscane (Italy), Macao Water (People's Republic of China), Sino French (People's Republic of China), LEMA (Jordan), JOWAM–WSSA (South Africa), Aguas do Amazonas (Brazil), Aguakan (Mexico), and PALYJA (Indonesia).

2. PT Astra International Tbk

8. PT Astra International Tbk (Astra), founded in 1957 as a general trading company based in Jakarta, Indonesia, was initially involved in agricultural trade. Astra is now one of the largest conglomeration business groups in Indonesia. It diversified into manufacturing and distribution of automobiles, heavy equipment, and components in the late 1960s. Astra currently has six core businesses: automotive, financial services, heavy equipment, agribusiness, information technology, and infrastructure. Astra was listed on the Jakarta and Surabaya stock exchanges on 4 April 1990. It is one of the few companies in Indonesia that is publicly owned and professionally managed. Astra has a diversified shareholder base, including significant foreign shareholdings. Astra is majority (50.11%) owned by Jardine Cycle & Carriage of Singapore, which in turn is majority owned by Jardine Matheson Group.

9. Astra's market capitalization as of 31 December 2006 was Rp63.9 trillion (equivalent to $7.1billion). Astra currently employs around 120,000 employees across its 130 subsidiaries and affiliates. For the year ended 31 December 2006, Astra's net income was Rp3.712 trillion (equivalent to $0.4 billion).

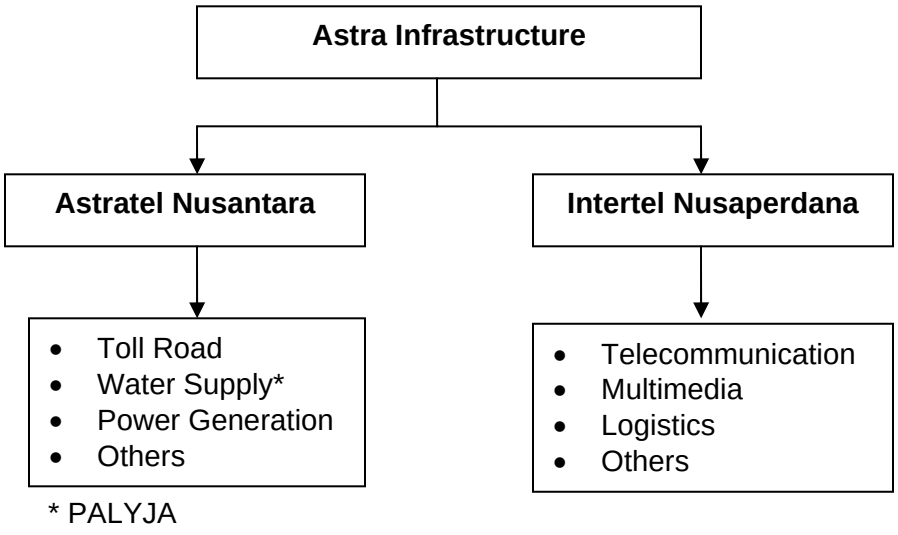
Table A4.2: PT Astra International Tbk Financial Highlights
(€ million)

Item	2006	2005
Income Statement		
Net revenues	55,508,135	61,731,635
Income tax	1,380,690	1,872,786
Net income	3,712,097	5,457,285
Cash Flow Statement		
Cash flow from (used in) operating activities	(9,020,067)	(2,221,958)
Cash flow from (used in) investing activities	(3,105,835)	(2,744,693)
Cash flow from (used in) financing activities	(5,039,623)	3,523,621
Balance Sheet		
Current assets	15,731,494	16,158,641
Noncurrent assets	42,197,796	45,008,025
Total Assets	**57,929,290**	**61,166,666**
Shareholders' equity	22,375,766	20,424,345
Minority interests	4,055,080	3,806,808
Long-term liabilities	11,427,947	15,018,298
Current liabilities	20,070,497	21,917,215
Total Liabilities and Shareholders' Equity	**57,929,290**	**61,166,666**
Financial Ratios		
Return on Assets	6.4%	8.9%
Return on Equity	16.6%	26.7%
Liabilities to Assets	54.4%	60.4%
Corporate Rating		
PEFINDO	idAA-	idAA-

PEFINDO = PT Pemeringkat Efek Indonesia.
Source: Astra International. 2006. *Annual Report*. Jakarta.

10. Astra manages its infrastructure business through two wholly owned subsidiaries, PT Astratel Nusantara and PT Intertel Nusaperdana. A simplified organization chart of Astra's Infrastructure is provided in Figure A4.1.

Figure A4.1: Astra Infrastructure Organization Chart



Source: Astra International. 2006. *Annual Report*. Jakarta.

11. PT Astratel Nusantara (Astratel) has been operating for 12 years and involved in the development of numerous infrastructure projects. Its main focus includes a toll road, water supply, and power generation. Detailed project involvement include the following:

(i) **Toll road**. Astratel bought a 54% stake in toll-road operator PT Marga Mandala Sakti (MMS) in August 2005; its effective ownership is 34%. MMS is the toll road operator of 72.45 km from Tangerang to Merak with a 30-year concession right. MMS has been in operation since 1992 and has 450 employees. It moved into profit for the first time in 2005, and in 2006 contributed net income of Rp2.5 billion to Astra.

(ii) **Water supply**. In July 2006, Astratel acquired a 30% stake in PALYJA, the operator of the Western Jakarta water system, from SUEZ Environment, the environment unit of SUEZ SA. In 2006 PALYJA contributed net income of Rp9.7 billion to Astra.

(iii) **Power generation**. In 2006, Astratel partnered with One Energy Limited, a joint venture between Japan's Mitsubishi Corporation and CLP Holdings Ltd. of Hong Kong, to bid for power plant projects in Indonesia.

B. Management

12. PALYJA's management team consists of a four-member board of directors whose activities are overseen by the five members of the board of commissioners. Current members of PALYJA board of directors have extensive background and experience in water, environmental

management, and finance (Table A4.3). Members of the board of commissioners have a variety of backgrounds, from water management, strategic planning, to financial services (Table A4.4).

Table A4.3: Board of Directors of PT PAM Lyonnaise Jaya

Member	Current Position	Professional Background	Educational Background	Serving Since
Thierry Krieg	President Director	General Manager, SUEZ Environment	Civil Engineering, ECAM, France	2003
Herawati Prasetyo	Vice President Director	Senior Manager, PT Wardley Summa Leasing	Accounting, University of Indonesia	2006
Edhie Sarwono	Director	Division Head, Environment and Social Responsibility, PT Astra International	Mechanical Engineering, Brawjaya University	2006
Jacques Manem	Director	Head, CIRSEE-Lyonnaise des Eau Group, France	Environmental Engineering, University of Illinois	2004

ECAM = École Centrale des Arts & Manufactures, CIRSEE = Centre International de Recherche Sur l'Eau et l'Environnement.
Source: PT PAM Lyonnaise Jaya. 2006. *Annual Report*. Jakarta.

Table A4.4: Board of Commissioners of PT PAM Lyonnaise Jaya

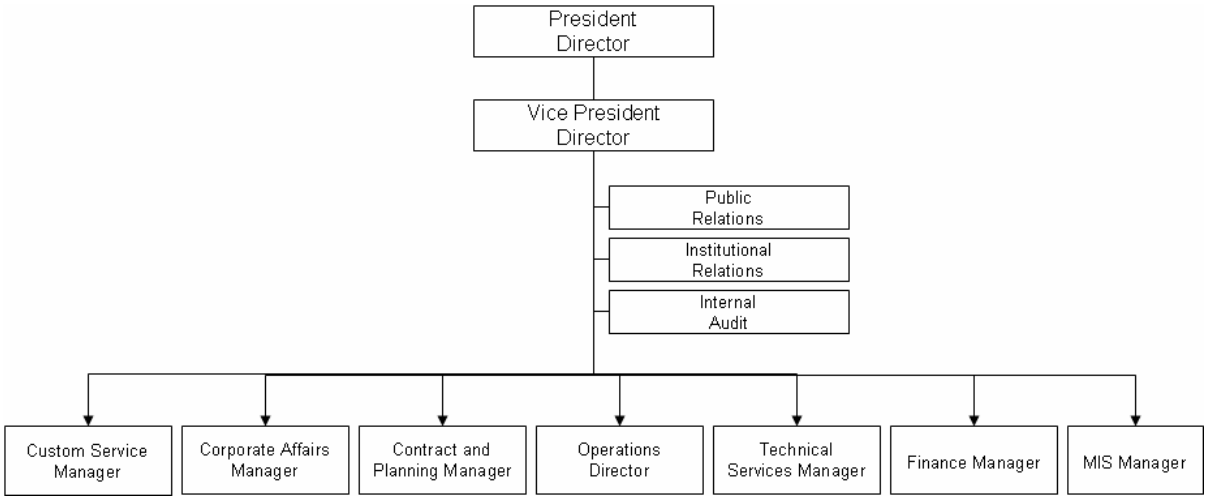
Member	Current Position	Professional Background	Educational Background	Serving Since
Angky Tisnadisastra	President Commissioner	President Director, PT Astratel Nusantara	Economics, University of Indonesia	2006
Erik de Muynck	Vice President Commissioner	Vice President Commissioner, SUEZ Environment		2007
Bernard Lafrogne	Commissioner	Commissioner, SUEZ Environment	Hydraulic Engineering, ENSEEIHT, France	1998
Irawan Santoso	Commissioner	Director, PT Astratel Nusantara	Electrical Engineering, Trisaksi University	2006
Marc Beatrix	Commissioner	Commissioner of Business Analysis, SUEZ Environment	MBA, Northwestern University, USA MS, ENSMA, France	2003

ENSEEIHT = École Nationale Supérieure d'Electrotechnique, d'Electronique, d'Informatique, d'Hydraulique et des Télécommunications; MBA = Masters in Business Administration , MS = Masters in Science.
Source: PT PAM Lyonnaise Jaya. 2006. *Annual Report*. Jakarta.

C. Organization Structure

13. As of March 2007, PALYJA has 1,400 employees, of which 902 are employees seconded from Perusahaan Daerah Air Minum Jakarta Raya (PAM Jaya) at the outset of the concession period. PALYJA is currently in the process of integrating seconded employees to become permanent employees of PALYJA, with the objective of enhancing employee equality and providing more flexibility with regard to labor management. The organization chart is presented in Figure A4.2.

Figure A4.2: PT PAM Lyonnaise Jaya Organization Chart



Source: PT PAM Lyonnaise Jaya.

D. Operations

14. PALYJA operates four water treatment plants including Pejompongan I and II ; Cilandak South; and Taman Kota North, and more than 5,000 km of primary, secondary, and tertiary water supply networks.

1. Treated Water Production

15. Sixty percent of PALYJA's water supplies are treated in the Pejompongan plants using water sourced from the West Tarum Canal system, which originates from Jatiluhur reservoir, 70 km southeast of Jakarta. The West Tarum Canal system is operated by Perum Jasa Tirta II, a state-owned company. Thirty-four percent of PALYJA's water supply is purchased, as bulk treated water, from Perusahaan Daerah Air Minum (PDAM) Tangerang. The remaining 6% of the company's water supply is from other surface water, which is treated in PALYJA's water treatment plants prior to distribution.

16. PALYJA's abstraction point from West Tarum Canal is located at Cawang at the downstream end. During the dry seasons an estimated 60% of the raw water supplied by the canal is from Jatiluhur; during the rest of the year it is between 20%-30%. The balance is mainly from Bekasi River. Due to intensive development in the Bekasi River catchment, the water is highly turbid, especially in the rainy season and also polluted by industrial and municipal wastewater. The volume varies substantially during heavy rainfalls in the catchment. These sudden variations can affect water treatment plant operation and the treatment process.

17. Each of PALYJA's plants is equipped with treated water reservoirs and pumping facilities. The two main water treatment plants at Pejompongan utilize electricity supplied by PLN as the source of power to distribute treated water to PALYJA's distribution network. Each of the plants

has two sources of electricity from PLN and during the 9 years of operation interruption of the power supply has been minimal, but has increased lately.

2. Distribution Network

18. PALYJA's concession area extends over 340 square kilometers. While the water distribution network covers the city center, the periphery of the concession area has limited coverage. The distribution network consists of primary, secondary, and tertiary pipes to transport and distribute treated water from PALYJA's production and pumping facilities to individual customers. PALYJA also operates a limited length of transmission lines, which transport bulk treated water, supplied by PDAM Tangerang, from the Jakarta city boundary to the pumping facilities.

19. To date, the total recorded length of the network is 5,105 km, of which 7% comprises primary mains (>300 mm in diameter), 20% secondary pipelines (150–250 mm), and the remainder tertiary pipes (<150 mm). Since 1998, 1,500 km of new pipes have been laid as part of the extension program and about 646 km of pipes replaced.

20. Since 1998, PALYJA has reduced water losses (commercial and physical losses) from 62% to about 49%, as a result of a continuous rehabilitation program including (i) leak detection and repair, (ii) network rehabilitation followed by decommissioning of old pipes, (iii) pressure control to reduce leakage, (iv) customer meter replacement, and (v) detection of illegal connections and unregistered customers.

3. Customers

21. Since 1998, PALYJA has increased the number of water connections to end users, from 201,668 at the beginning of the concession to 351,230 at the end of 2006. This represents a 74% increase as a result of network densification, expansion, and rehabilitation.

22. In developing future customers, PALYJA is sensitive to providing services for low-income customers, ensuring that low-income areas are given priority for establishing new distribution networks and connections. Further, the water tariffs approved by the governor of Jakarta are set such that social and low-income customers pay less for water than high-income individuals and business entities. As a result, the number of low-income customers increased by 456% as compared with the 50% increase of middle and upper-income customers since the beginning of the concession.

23. To better serve customers and help ensure customer satisfaction, PALYJA has set up a 24-hour call center to handle emergencies such as leaks, broken pipes, and other such events. Bill payment is facilitated through collaboration with a number of entities, and customers may pay their bill in a number of ways, including Citibank 1 Bill, Bank BCA ATM, by direct debit, or at any Jakarta post office. Alternatively, customers can pay at any of PALYJA's own payment centers. To make customer management more efficient, PALYJA maintains an online customer information system, centralizing customer profiles and information records on billing, payment collection, and the reconciliation process. On average, approximately 80% of customers pay their bill within 1 month of receipt; historically the overall collection rate is 97%–98%.

E. History of the Concession

1. Background

24. Since the official start of the privatization campaign in 1995 at the orders of then President Suharto, Jakarta developed one of the world's largest public-private partnerships in the water sector. The city of Jakarta was divided into two parts, east and west, with the boundaries determined by the natural flow of Ciliwung River. A number of stakeholders were involved in the privatization, including the Jakarta city government; PAM Jaya, the state-owned water utility;[19] and the two newly established private companies, PT Thames PAM Jaya[20] and PALYJA.

25. On 1 February 1998, PALYJA formally entered into a 25-year cooperation agreement with the Government. The concession allows PALYJA to take over responsibility of operation, maintenance, and development of the water supply system from PAM Jaya, including rehabilitation and expansion of the water supply network, meter reading, bill collection, and customer service. All existing assets, except the PAM Jaya headquarters office, are managed by the private partner, and at the end of concession all assets including new assets built by the private partner will be returned to PAM Jaya.

26. Within 3 months of signing the original cooperation agreement, Indonesia was involved in the economic turmoil of the Asian financial crisis. Following the overthrow of the Suharto regime in 1998, challenges were made to the legitimacy of the two concessions. The Indonesian Government under President Habibie temporarily reclaimed the concessions under public authority. Control of the West Jakarta concession was returned to PALYJA, but not without renegotiation of the terms and conditions of the original cooperation agreement. In 2001, PAM Jaya and PALYJA finalized the terms of a renegotiated cooperation agreement.

2. Delinking Tariffs and Revenues

27. One of the innovations of the concession is the delinking of (i) the revenues received by PALYJA under the cooperation agreement (the water charge), and (ii) revenues collected from consumers by PALYJA (the water revenues). This system offers two main advantages: (i) it helps balance revenues between the two concessionaires in Jakarta, given the differences in social and economic characteristics of the two concessions, which affect both costs and revenues; and (ii) it allows the Government greater flexibility in the timing of tariff increases.

28. The water charge received by PALYJA comprises a flat rate of revenue for each unit of water delivered, which is set according to PALYJA's financial projections, including projections of operating and capital expenditures and financing costs, to provide a fixed rate of return on equity (in rupiah) of 22% over the life of the concession. The water charge is adjusted every semester to account for fluctuations in the exchange and interest rates, and is reviewed at 5-year intervals in the rate rebasing exercise. Rate rebasing establishes a revised operating and financial plan, which is used as the basis for establishing appropriate charges for the subsequent 5 years.

[19] PAM Jaya had the historical responsibility of water supply in the city of Jakarta. Appendix 2 provides more details on the background of PAM Jaya operations prior to the concessions.

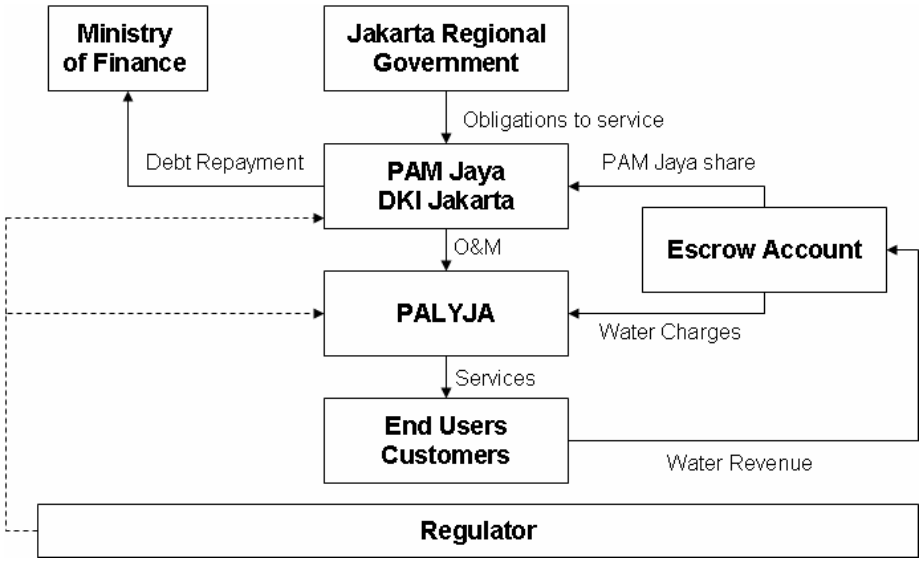
[20] PT Thames PAM Jaya is a joint venture between RWE Thames (Thames), a British multinational owned by German Rheinisch- Westfälisches Elektrizitätswerk, and PT Kekarpola Airindo (PKA), a local company

29. Customers, on the other hand, pay differentiated tariffs according to a preestablished schedule. The Jakarta city government is responsible for assessing and setting the water tariff schedule; and a decree of the governor of Jakarta is required to change the water tariff.

3. Revenue Sharing

30. The water revenues collected by PALYJA are transferred into an escrow account, from which funds are transferred to PALYJA to meet the water charge and to PAM Jaya. According to priorities established in the cooperation agreement, funds will be made available in the following order: (i) capital and operating expenditures for PALYJA and relevant financing charges; (ii) payment to PAM Jaya and the Jakarta city government, debt repayment to the Ministry of Finance, and the regulatory body's requirements; and (iii) payments for the revenue shortfall and other monies. The mechanisms are illustrated in Figure A4.4.

Figure A4.4: Revenue Sharing under Concession



DKI = Daerah Khusus Ibukota, PALYJA = PT PAM Lyonnaise Jaya, PAM Jaya = Perusahaan Daerah Air Minum Jakarta Raya.
Source: PT PAM Lyonnaise Jaya.

4. Revenue Shortfall and Corrections

31. The original intention was that water tariffs would always be set such that water revenue exceeds the water charge by a margin sufficient to cover (i) administrative costs of PAM Jaya and the regulatory body, (ii) repayments due on PAM Jaya's previously incurred loans from the Ministry of Finance, and (iii) PALYJA's operating and capital investment costs.

32. However, the combination of the tariff freeze imposed through 2000 and the high increase of the water charge as a result of the rupiah devaluation and soaring inflation resulted in a shortfall of water revenue relative to the water charge. The revenue shortfall was treated as

an account payable to PALYJA from PAM Jaya, to be paid when water tariffs could once again be raised so that the water revenue exceeded the water charge.

33. Water tariffs were first increased by 35% in April 2001 at the conclusion of the renegotiated cooperation agreement negotiations. For a short period, water revenues were sufficient to cover the water charge. As part of the renegotiated cooperation agreement, the Jakarta government committed to increase tariffs in both January 2002 and January 2003. Neither of these tariff increases was implemented, and as a result, water revenue once again dropped below the water charge, adding to the accrued liabilities of PAM Jaya to PALYJA. Tariffs were eventually raised in April 2003 (by 40%) and in January 2004 (by 30%). In 2005, a proposal for automatic tariff increases—automatic tariff adjustment mechanism—was implemented by the Jakarta government with the objective of keeping water revenue above the water charge on a consistent basis. Since the second quarter of 2003, water revenue has consistently exceeded the water charge and PAM Jaya has applied some of the excess revenues to repaying amounts owed to PALYJA.

ENVIRONMENTAL AND SOCIAL DUE DILIGENCE REPORT[21]

A. Introduction

1. The Jakarta water supply enterprise, Perusahaan Daerah Air Minum Jakarta Raya (PAM Jaya), a state-owned enterprise established in 1977, was responsible for water supply and sewerage services in Jakarta until late 1997. In 1997, the right to operate the city's water supply system was offered to private enterprises under two separate concessions: PT PAM Lyonnaise Jaya (PALYJA) in West Jakarta and PT James Pam Jaya in East Jakarta. They began operations in early 1998. PALYJA shareholders comprise SUEZ Environment (51%), PT Astratel Nusantara[22] (Astratel, 30%), and Citigroup Financial Products, Inc. (19%). SUEZ Environment is a branch of the global SUEZ SA (SUEZ)[23] that supplies services, plant, and equipment drinking water production and distribution, wastewater collection and treatment, and waste processing and recycling.

2. PALYJA has requested Asian Development Bank (ADB) financing for the development of the water supply network in Western Jakarta in support of the Millennium Development Goal (MDG) target of reducing the proportion of people without access to safe drinking water and basic sanitation by half by 2015 (MDG 7, Target 10), The proposed ADB loan will be used by PALYJA to partially fund its capital expenditure program during the third 5-year period of the concession (2008–2012) for the expansion of the company's water production and supply network in its West Jakarta concession area. While PALYJA's corporate vision is to "be the preferred water services provider in Indonesia by satisfying customers and adding value to stakeholders," its mission statement includes a commitment to be "socially responsible, to protect the environment and to implement good governance."[24]

B. Organization Structure

3. PALYJA is a subsidiary of SUEZ and is one of the largest water service providers in Indonesia. PALYJA entered into a 25-year cooperation agreement with the Government commencing 1 February 1998. The scope of services under the agreement includes the design, construction, refurbishment, and operation of water supply systems, technical and quality control, human resources and training, financing of new works, and billing and collection.

4. PALYJA has almost 1,400 employees, of which about 900 are employees seconded from PAM Jaya at the outset of the concession. PALYJA is currently integrating seconded employees to become permanent employees of PALYJA, with the objective of enhancing employee equality and providing more flexibility in labor management.

5. PALYJA's major improvements and achievements achieved after 9 years of operation include

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[21] This report is based on a mission (S. Edwards, mission leader; A. Akanda; L. Shen; T. Beiling; and N. Soewarno) that visited PALYJA offices, facilities, and construction sites during 1–3 May 2007.

[22] Astratel is a subsidiary company of PT Astra International Tbk (Astra), an Indonesian conglomerate that employs nearly 120,000 employees in a widely diversified portfolio (automotive, financial services, heavy equipment, agribusiness, information technology, and infrastructure), with a market capitalization of over $4.0 billion.

[23] SUEZ is an international industrial and services group based in France for the energy and environment sectors, with more than 150,000 staff working across four continents serving some 200 million people in 3,000 municipalities, and with annual revenues of over $50 billion.

[24] PALYJA, *Vision, Mission and Values*.

(i) population served in West Jakarta increased by 1.25 million, of which 20% are members of low-income communities;
(ii) service coverage ratio increased from 32% in 1998 to more than 55% in 2006;
(iii) low-income customers increased by 370%, and middle- and upper-income customers by more than 50%;
(iv) water loss or unaccounted for water reduced by 12%, i.e., from 60% to 48%;
(v) improvement of the state of the network and reduction in water shortage is noticeable; and
(vi) 99% of treated water fully complies with clean water standards, i.e., water quality compliance both at the production and distribution facilities.

C. Social and Institutional Issues

6. **Employment Conditions.** PALYJA's Company Regulations 2006–2008 are based on *Pancasila* and the Indonesian Constitution (UUD 1945), and prevailing human resource regulations in Indonesia. The regulations contain work requirements, procedures, and rights, as well as obligations of the company and employees. PALYJA subscribes to all International Labor Organization conventions related to workplace conditions that have been ratified in Indonesia, particularly as its shareholders are SUEZ, a major global employer, and Astratel, one of Indonesia's largest conglomerates. All employees have positions that are fully pensionable with adequate benefits.

7. **Workplace Conditions**. Health and safety are covered by Articles 44–53 of the Company Regulations 2006–2008.[25] Occupational accidents are covered under PT Jamsostek[26] regulations. A comprehensive employee safety handbook is issued to all employees and contractors, and a signed statement of understanding kept on file. An exceptional feature of PALYJA's commitment is that it has a well-structured health and safety strategy and action plan with clear objectives, processes, and targets. PALYJA aims to achieve Gold (Occupational Health and Safety Management System) and Occupational Health and Safety Assessment Specification 18001 by 2009. Grievances are handled through an employee protection panel, which consists of representatives of PALYJA, PAM Jaya, and the PALYJA labor union. Currently, PALYJA does not have a union, although PAM Jaya has three unions. Within the organization, the Health Safety Department reports to the director, corporate affairs. Accident rates have been very low, with only one work-related accident reported in 2007, and no fatalities reported since PALYJA assumed its responsibilities. As corporate offices and plants are located in the city, the sites have basic first-aid facilities, with immediate access to local hospitals. Hazardous wastes, essentially chlorine, are stored and secured in regulated locations to ensure safety for workers on-site. Regular fire drills and training in first aid are held at corporate offices and plants.

8. **Community Consultation, Disclosure, and Grievance Procedures.** [27] PALYJA manages its territory with three service units. Each unit (south, west, central) has a dedicated public relations team to conduct community meetings on PALYJA projects. About 2 weeks before the project starts, the public relations team, together with the contractor, will contact the

[25] These also draw on the 2002 Health and Safety Charter of SUEZ

[26] The Indonesian social welfare organization that seeks compliance with human rights identified in articles 24–34 of the Constitution, articles 22–25 of the United Nations Universal Declaration of Human Rights, and International Labour Organization Convention 102 (1952). The regulations are based on Law 33 of 1947 on Employment Accidents, Law 2 of 1951 on Work Accidents, and Law 14 of 1969 on Main Provisions for Labor. JAMSOSTEK covers employment accident, death benefits, old-age benefits, and health care benefits.

[27] PALYJA. 2006. *Minimum Environmental and Community Requirements for PALYJA Projects*. Jakarta

head of the lowest administrative unit in the city, to conduct social awareness activities regarding new projects, network rehabilitation, and tariff adjustments. For complaints during civil works, the community may contact either the contractor or related units in PALYJA; once they become PALYJA customers, they can contact the PALYJA call center, a 24-hour service.

9. **Customer Satisfaction.** A comparison of customer satisfaction survey results between 2005 and 2006 show an increase in positive responses from customers covering all areas/categories (domestic, commercial, and institutional) (Table A5.1)

Table A5.1: Summary of Customer Opinion

Customer Satisfaction	Results	
	2005	2006
Overall	55%	64%
On billing process	72%	79%
On meter reading accuracy	66%	78%
On customer service	46%	59%
On water quality (pressure, supply continuity, potability, cleanliness, absence of unpleasant odor, color/clearness, and chlorine-like odor)	64%	67%

Source: PT PAM Lyonnaise Jaya.

10. **Water Supply-Related Social Issues.** In the area served by PALYJA, affordability for low-income consumers is assured because of the significant cross-subsidy from non-domestic consumers, who pay about Rp12,500/cubic meter (m^3) compared with Rp1,050/m^3 for low-income clients. While significant groundwater is extracted through borewells, for which the approximate cost is Rp3,500/m^3, consumers are gradually appreciating the convenience of assured -clean water supply compared with the bacteria-laden and mineral-heavy groundwater.

11. Following the lead of its two major shareholders, SUEZ and Astratel, PALYJA has a structured approach to community relations: community development programs, low-income consumers (water for all), orphanages (tuition), disaster (Jogjakarta earthquake), 26 water tankers free for those who have no access (slums, breakdowns/interruptions), and slum water reservoirs. PALYJA finances about $2.5 million ($5 million is the total if TPJ included) of low-income water access schemes under the World Bank's Global Partnership on Output-Based Aid for some 7,000 families. Responding to the recent tsunami in Aceh, PALYJA set up six mobile water purification units, placed four staff in the area for more than 3 months to be responsible for continuous delivery of potable water using two 50,000-liter water supply vehicles, coordinated the logistics of 18 potable water supply vehicles in the area that were subsequently turned over to a nongovernment organization, assigned two people to maintain the water supply line until connections were reestablished, and provided training to PDAM Aceh's municipal water company. In addition the Group[28] and *Fondation Suez* made substantial cash donations.[29]

[28] SUEZ maintains a volunteer humanitarian aid group, Aquassistance, which responds to emergency environment and water supply situations worldwide.

[29] Created in 1992, the Suez Foundation lends support to children in adversity. It assists projects that contribute to the respect, protection, and full development of children throughout the world. Its three priority areas of concern are children facing prolonged hospitalization, children infected with AIDS, and children who are victims of profound upheaval or whose lives are extremely precarious.

D. Environmental Issues

1. Corporate Environment Policy

12. PALYJA's corporate environment charter was approved on 10 October 2006. Following the president's remarks,[30] the charter's preamble sets out four areas through which it intends to fulfill PALYJA commitment to environmental management:

- (i) Commitment
  - (a) taking account of environmental and sustainable development
  - (b) respect for environmental protection and public health laws
  - (c) organization and responsibilities
  - (d) mobilizing each employee
- (ii) Understanding
  - (a) environmental analysis
  - (b) risk prevention
  - (c) crisis management
  - (d) willingness to listen
- (iii) Know-how
  - (a) research and development
  - (b) reducing adverse impacts and improving the environment
- (iv) Sharing
  - (a) communication
  - (b) partnership
  - (c) awareness raising, education, and training
  - (d) sponsorship

13. The areas cover those identified by ADB as essential elements of an environmental management system (EMS): policy statement, work processes and procedures, organization, budgeting, monitoring, and reporting. The EMS is also consistent with the requirements of Indonesia's Law 23 on Environmental Management (1997).

14. The EMS reflects the corporate philosophies of the two principal shareholders, SUEZ and Astratel. SUEZ, a member of the United Nations Global Compact and its 10 principles since 2000, has explicit commitment to and defined strategic directions in five priority areas in supporting sustainable development objectives: reflecting the values of sustainable development in practices and culture, integrating sustainable development in commercial offers for the benefit of customers and users, protecting the environment,[31] promoting the social

[30] "PALYJA is committed to the protection of the environment and will employ environmental management systems and procedures specifically designed to its business process to prevent activities and/or conditions that pose a threat to (human health, safety) the environment, which includes waste minimization, prevention of pollution, and reasonable efforts to comply with all relevant environmental legislation and regulations. PALYJA will work continuously to improve the effectiveness of its environmental management; offering customers the most efficient techniques and the best know-how; providing appropriate environmental training and educating employees to be environmentally responsible on the job and at home; and monitoring environmental performance regularly. All processes of production and all damage to the environment depend on how individual people work. No matter how advanced the environmental technology is, its result depends on the measure of environmental awareness enjoyed by those who operate it."

[31] The subpriorities are: "maintain compliance at our sites and manage regulatory changes; measure and control environmental risks within the Suez Risk Management Policy; minimize the environmental impact of our activities over time; expand environmental management systems." SUEZ, *Sustainable Development: Cornerstone of Our Strategy - 10 Years of Social Responsibility Initiatives*, 2006.

commitment of SUEZ, acting as a corporate citizen, and ensuring local roots for SUEZ business. The company fully recognizes accountability to its stakeholders: financial, [32] social, [33] commercial, [34] and government. [35] Among other notable initiatives that SUEZ seeks to disseminate across its operations is gender parity, with a working group whose mandate is to reduce gender disparities and support the work of a parity observatory. SUEZ has about 2,000 sites certified ISO 14001, ISO 9001 V2000 or EMAS. The Group set up the International Social Observatory in 1998 as a forum to observe, analyze, and integrate human and social dimensions into business decisions.

15. Demonstrating a strong and consistent commitment to environmental sensitivity, Astra has evolved from utilizing environment, health, and safety committees in the 1970s to end-of-pipe approaches in the 1980s, to self-monitoring and the four Cs (commitment, compliance, competence, and cleaner production) in the 1990s, to its current philosophy of Astra green company with four pillars: green strategy, green process, green product, and green employees. Astra's corporate philosophy of the green company is one in which management consciously emphasizes protection and development of stakeholders' environment, health, and safety into every business decision, which represents a continuing effort to contribute positively to the community and sustainable development. The green company concept has been introduced in all Astra-affiliated companies (e.g., automotive, heavy equipment, mining, plantations). Astra has also adopted the triple bottom line[36] for sustainable business. Examples of good practice have been (i) in the automotive industry: sand reuse for shell molding, recycling of wastewater and materials (cotton gloves, metal wastes, etc.), and utilization of ash for brick manufacture; and (ii) in plantations: reduction of pesticides by using biopredators; and training in principles of refine, reduce, reuse, recycle, recover, and retrieve-to-energy. Currently, Astra has 351 environment officers, 90 safety officers, and 112 health officers.

2. Environmental Management[37]

16. Environmental management at PALYJA follows the well-established practices of the major shareholders. PALYJA has set in place all elements of an acceptable EMS, which is essentially carried out through environmental risk auditing, introduced by SUEZ in January 2006 as a precursor to its environmental charter.

17. Environmental aspects of PALYJA operations are handled by the Operations Department, while health and safety issues are handled by Corporate Affairs. The dissemination of summary environmental reports is the responsibility of the Contract and Planning Department, which also administers the water for all program. Social and institutional issues related to customer care and satisfaction, and legal compliance are handled by the Institutional Relations

[32] Shareholders, investors, and financial institutions.
[33] Trade unions, employees, and residents.
[34] Consumers, local communities, industrial consumers, and suppliers.
[35] International institutions, governments, academic world, media, associations, and nongovernment organizations.
[36] The triple bottom line (3BL) measures the success of a corporation from financial, social/ethical, and environmental performance perspectives. Essentially coined by John Elkington in Elkington, John. 1997. *Cannibals with Forks: The Triple Bottom Line of 21st Century Business.* Oxford. Capstone Publisher Limited. 3BL has been widely adopted globally by firms, government agencies, and nongovernment organizations. However, the concept has its detractors, as in Norman, W. and C. MacDonald. 2003. Getting to the Bottom of Triple Bottom Line. *Press, Business, Ethics Quarterly (*March); Wayne Norman and Chris MacDonald. 2007. Rescuing the Baby from the Triple Bottom Line Bathwater. *Business Ethics Quarterly* (January).
[37] PALYJA. 2007. *Implementation of Environmental Management and Monitoring Plan*, Powerpoint presentation to Mission, Jakarta, 2 May.

and Illegal Connection Department. All departments are directly accountable to the PALYJA president. PALYJA has three environment specialists and four health and safety officers.

18. PALYJA fully complies with Indonesian regulations for clean water standards (Decree No. 426/MENKES/PER/IX/90) and drinking water standards for microbiological parameters for the production of water (Decree No. 416/MENKES/PER/IX/90). Although discussions continue on PALYJA's ability to comply with the Regional Environmental Management Agency DKI Jakarta (BPLHD Daerah Khusus Ibukota Jakarta) environment policy for sludge discharge or waste storage, the company will comply with the new regulations on drinking water standards to be enforced in Indonesia in 2008.

3. Environmental Reporting

19. Environmental monitoring activities in PALYJA are located primarily in the Production and Distribution Division of the Operations Department. The quality assurance and environment manager, who oversees the work of three engineers, is responsible for preparing detailed reports, which are then submitted to the environment officer for dissemination. Together with 6-monthly reports, an annual environment and operations performance report is submitted to both SUEZ and the Indonesian Ministry of Environment as part of the structured reporting system at PALYJA.

20. Environmental highlights of 2006 included the following:

(i) Replacement of coagulant used in the water treatment process from aluminum sulfate (AL_2SO_4) to aluminum chlorohydrate (ACH) to minimize sludge concentration. The trials indicate that (a) a reduced coagulant dosage with ACH up to $\pm$ 90%; and (b) the pH value of treated water was more stable; the sludge volume reduced (based on Jar Test). Pejompongan II has used ACH for full plant scale since January 2006, with the amount of lime reduced from 2,000–3,000 kilograms (kg)/day to about 400 kg/day.

(ii) In April, the Production Engineering Section and Environment Section conducted a benchmark for *Perusahaan Daerah Air Minum* (PDAM)[38] Tirta Cisadane Water Treatment Plant in Serpong, Tangerang to learn about the reuse technique for filter backwash wastewater.

(iii) In May, monitoring of TCLP, [39] LC50,[40] and LD50[41] was conducted to ensure that the water discharge from water treatment plants was not categorized as hazardous waste.

(iv) In August and September, the Quality Assurance Group evaluated raw water sources for the Cilandak and Taman Kota water treatment plants.

(v) An investigation was conducted on inappropriate disposal of flammable waste.

(vi) In August, trials of hazardous waste transportation were conducted to prepare procedures for PALYJA.

[38] Municipality.

[39] Toxicity characteristic leaching procedure (TCLP) is designed to determine the mobility of both organic and inorganic analyses present in liquid, solid, and multiphasic wastes using USEPA SW-846 Method 113.

[40] Lethal concentration fifty (LC50) is an analysis to identify effluents and receiving waters containing toxic materials in acutely toxic concentrations.

[41] Lethal dose fifty (LD50) is defined as the medium lethal dose of material that is given to test organisms and estimated to be lethal to 50% of organisms.

(vii) In October and November, respectively, the Environmental Charter and the PALYJA *Minimum Environmental and Community Requirements for Pipelaying Works or Network or Distribution Projects*[42] were issued.

(viii) In May 2006, the *Review of Technical Operations and Environmental Due Diligence for PALYJA* was completed by Sinclair Knight Merz was prepared and submitted to PALYJA.

4. International Organization for Standardization (ISO) Certification

21. PALYJA is working toward ISO 18000 OSHAS certification at the plants. It has already obtained ISO 17025 for the laboratory management system and ISO 9001 at Cilandak; it expects to have ISO 9001 at Pejompongan I and II by the end of the year 2007 at the earliest.

E. Water Treatment Plants

1. Water Treatment Plants

22. PALYJA operates (i) four water production/treatment plants, including Pejompongan I and II (5.6 m^3/s); Cilandak South (0.4 m^3/s); and Taman Kota (0.2 m^3/s);and (ii) more than 5,000 km of primary, secondary, and tertiary water supply networks.

23. Sixty percent of PALYJA's water supply is treated at the Pejompongan plants using water sourced from the West Tarum Canal system, which originates from Jatiluhur reservoir, 70 km southeast of Jakarta. The West Tarum Canal system is operated by Perum Jasa Tirta II, a state-owned company. Thirty-four percent of PALYJA's water supply is purchased as bulk treated water, from Perusahaan Daerah Air Minum (PDAM) Tangerang; the remaining 6% is from other water surface, which is treated in the company's water treatment plants for distribution.

2. Assessment of Facilities

24. Pejompongan I and II, built in 1957 and 1970, respectively, are in good condition, with a remaining life of 20–30 years. A 2006 study[43] pointed out that given that reinforced concrete process tanks and storage reservoirs are subject to deterioration after many years, studies need to be initiated to fully determine their condition. The capacity constraint on Pejompongan I and II is the condition of the treated water pipeline. Quality deterioration and quantity reduction of raw water are seen as the biggest risks for PALYJA; hence, continued pressure needs to be put on the Government, particularly the Jakarta local government and surrounding cities,, to regulate the discharge of pollutants into the canal system, with the imposition of stiff penalties and an effective enforcement mechanism. The treatment of sludge is unique in PALYJA's operations. Following earlier practice, PALYJA is currently discharging sludge from the water treatment plants back into the watercourses, which it recognizes is not consistent with global good practice, but it is constrained by the lack of formal national and local government regulations for discharge water from water treatment plants; the current regulations refer only to standards for liquid waste from other industrial groups.[44] However, the sludge consists primarily of inert materials and as currently treated, is of no significant threat to the water quality and quantity in the watercourses. PALYJA is continuing discussions with the Jakarta government to establish

[42] Necessary steps and guidelines to ensure safety and environment-friendly measures that will minimize environmental problems during construction.

[43] Sinclair Knight Merz, *Review of Technical Operating and Environmental Due Diligence for PALYJA*, May 2006.

[44] *DKI Jakarta Governor's Decision No. 582 of 1995 regarding the Utilization and Standard Quality of Rivers and Standard Requirement of Liquid Waste in DKI Jakarta*, Appendix V.

norms for acceptable sludge discharge, and develop regulations for discharge at the treatment plants. PALYJA has adopted the following strategy agreed with the local government. It will

(i) continue to implement cleaner production activities that include reducing sludge with the use of nonhazardous chemicals,[45] as conducted since 2005 in Pejompongan 2, and which will be implemented in Pejompongan I in 2007;
(ii) participate regularly in the River Conservation Program coordinated by BPLHD DKI Jakarta;
(iii) conduct historical analyses on its water discharge quality, and participate closely in discussions carried out by BPLHD DKI on proposed amendments to Daerah Khusus Ibukota (DKI) Jakarta governor's Decision No. 582 of 1995;
(iv) adopt water discharge management in the Cilandak water treatment plant as a pilot project using centrifugation equipment; and
(v) conduct a study on sludge utilization for recycling backwash filters for all water treatment plants as part of efforts to reduce the discharge volume, and to work toward a comprehensive solution to the sludge problem.

25. The Mission visited Pejompongan I, which it found to be very well managed, with attention to all environmental aspects. The plant was well maintained, with clear management procedures for water treatment, storage, and distribution areas. The concrete storage tanks did not display any visible weakness, although the Mission pointed out that after so many years, a detailed structural study might be in order. Nonetheless, the tanks are cleaned thoroughly every year, and were renovated in 2002. Hazardous materials (chlorine, caustic soda) are stored at secure places, requiring permission and proper apparel for entry; breathing apparatus was sited at accessible locations throughout the plant. Testing was done frequently at scheduled monthly intervals. Although the water was fully potable at the site, leaks in the distribution pipes could be responsible for water contamination; hence, an active leak detection and repair system is maintained by PALYJA, although pipe laying and rehabilitation is outsourced. The water filters are self cleaning every 72 hours. SCADA[46] is used to detect variations in pressure across zones, thereby identifying potential leaks. Noise was within acceptable levels (World Bank standards) at the pumps. The use of higher amount of chlorine at 1 mg/liter is justified due to the long distances covered by the distribution pipes. The Mission noted the presence of waste materials (transformers, sheeting, construction materials), but was assured that storage was temporary, pending collection by a private contractor to an approved site. However, the Mission drew attention to the importance of proper disposal of transformer oil, which was mentioned as being free of polychlorinated biphenyl.

F. Construction Practices

26. Recognizing the importance of working with communities in project development and implementation, PALYJA has confirmed its responsibilities to the Ministry of Public Works in the *Environmental Assessment, Management and Monitoring Statutory Obligations*.[47] Environmental and social requirements/responsibilities that the contractors must comply with during construction, particularly pipe-laying works and/or network or distribution projects, are set out in *Minimum Environmental and Community Requirements*.[48]

[45] The pH stable aluminum chlorohydrate (ACH), which is finding much greater use in potable water treatment plants is being used to replace aluminum sulfate. ACH is expensive, but can be used in lower does than alum, and is more effective in reducing sludge concentration.
[46] Supervisory Control and Data Acquisition, a system that collects and centralizes data from various sensors.
[47] PALYJA. 2006. *Environmental Assessment, Management and Monitoring Statutory Obligations.* Jakarta.
[48] PALYJA. 2006. *Minimum Environmental and Community Requirements.* Jakarta.

27. Detailed procedures are set out for contractors to adhere to mandatory requirements that include minimizing community disruption; coordinating with the city Public Works Department in the planning and construction of buried pipelines; selecting locally available materials that meet the specifications for trench backfill material; ensuring that approved borrow sites can be restored or rehabilitated; and providing for flow of all watercourses, sewers, drains, etc.

28. Table A5.2 provides a summary of requirements to be complied with by contractors.

Table A5.2: Requirements for Contractors

Environmental/Social Parameters	Required Activities of Contractors
Administration	Before commencing work on a project, • submit work permit from PALYJA; • submit the required installation permits from DKI (environmental management and monitoring permit), Public Works Agency permit; • together with local municipalities (kelurahan), arrange community meeting; distribute pamphlets informing existence of the project; and apologize for possible inconvenience, i.e., noise, dust, traffic disturbance, crowded area caused by workers, materials, equipment, and vehicles; • submit required measures to be taken to minimize such effects to communities.
Other Utilities	Seek information on the location of other utilities (gas, electricity, and telecommunications).
Archaeological or Cultural Sites	Coordinate with the Historic Preservation Agency to avoid any impact occurring to the cultural sites as a result of the project.
Environment Equipment	Have available at all times • list of chemicals used, • material safety data sheets, • leakage and spill equipment, • dedicated drum for oil waste, and • cleaning equipment and necessary disposal drum for solid waste.
Resource Management	Initiate awareness about PALYJA's environment policy, prevent any kind of pollution (water, air, soil), and aim at energy efficiency and water-saving in operations.
Waste Management	Keep the work site and other areas neat and clean, free from any accumulation of rubbish.
Materials	Do not use asbestos or other hazardous material. In the event that such materials have to be used, inform PALYJA and conform to related regulations.

DKI = Daerah Khusus Ibukota.
Source: PT PAM Lyonnaise Jaya.

29. The Mission visited two rehabilitation sites to see how PALYJA managed construction-associated social and environmental issues. The first site was on a major thoroughfare, involving repair of a major leak.[49] The area was well marked, traffic regulated, and works

[49] Helium is being used as a tracer in the water supply to identify the location of invisible leaks, which do not reach the surface and are particularly difficult to find in the Jakarta network owing to many kinds of pipe materials, low pressure, traffic conditions, etc.). In 2006, 828 leaks were detected along 1,103 km.

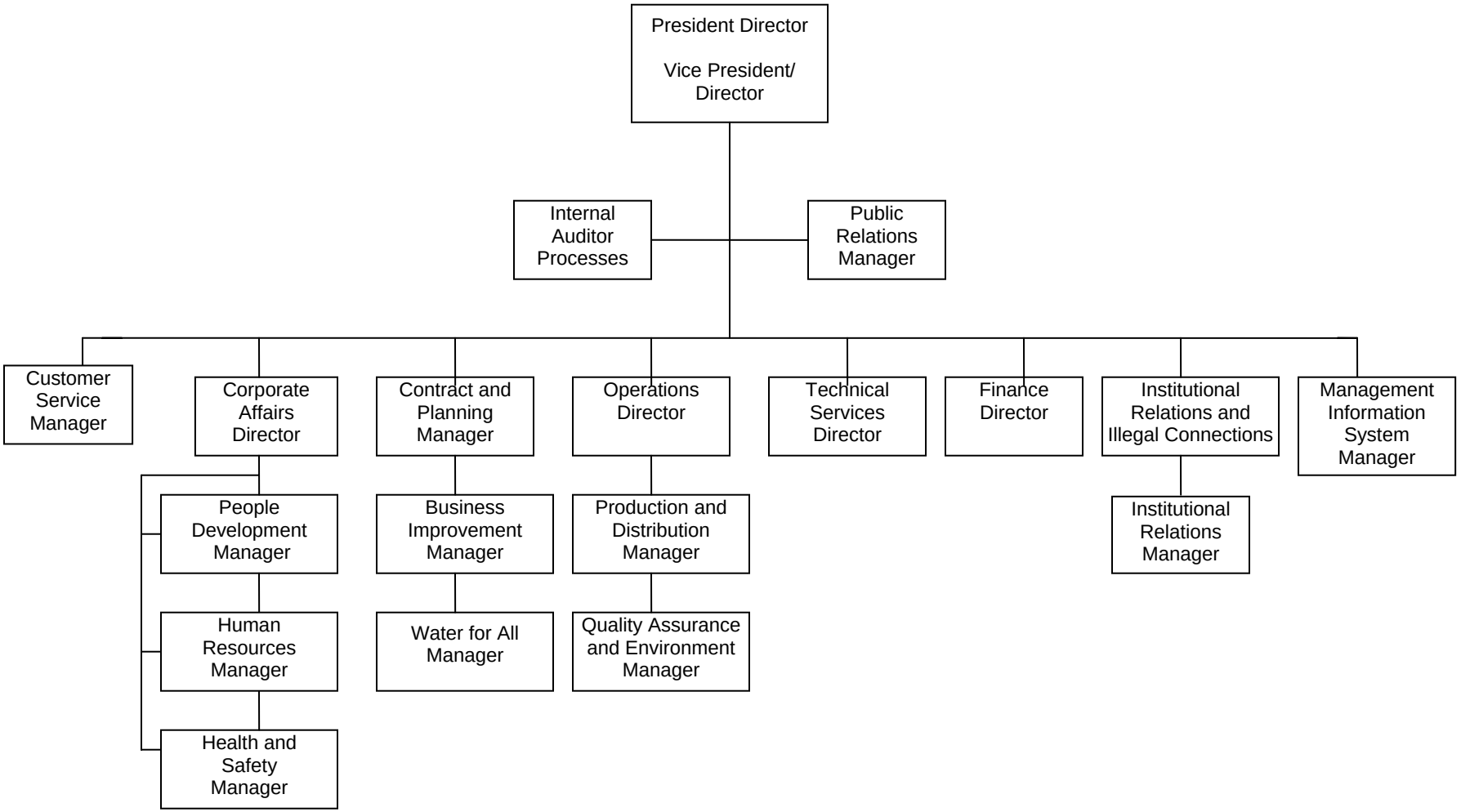
scheduled to be completed in as little time as possible (3 days). Local residents and businesses had been informed prior to commencement of repairs.

30. The second site involved pipe laying in a densely populated low-income area, Kema Prasath. The alternative to piped water had either been borewells (lower groundwater levels resulted in the water becoming salty) or tankers that charged high rates for a full load. The water provided in those circumstances was not free of contamination. The residents (women) with whom the Mission spoke were enthusiastic about the availability of clean water, and fully agreeable to the charges that PALYJA would impose for connections and usage. The contractors were obliged to complete works quickly to avoid prolonged inconvenience; in the area visited, the time taken for trench cut, excavation, sand fill, pipe laying, and earth cover was about 4 hours for every 100 m. The workers at the site were properly equipped, particularly with masks and earplugs for those operating jackhammers.

G. Conclusion

31. Review and evaluation of the available documents/information and the conduct of the site visit demonstrate that PALYJA's current operations have fully taken into consideration the environment, health, and safety aspects required by ADB within an EMS framework relevant to the water supply sector. Materials and documents, such as *Employee Safety Handbook*, *Health and Safety at Work* (SUEZ), *Minimum Environmental and Community Requirements for PALYJA*, and *Project and Environmental Management and Monitoring Plans* serve as guidelines and procedures that promote staff and contractor awareness of good environmental, health, and safety management practices. Adequate staff and financial resources are in place, with commitment by PALYJA to increase the effectiveness of its environment management, monitoring, and reporting systems. The ADB mission is satisfied that the framework of an effective EMS exists and is capable of producing the ADB-required annual environmental and social performance report to acceptable standards under the guidance of the quality assurance and environment manager. However, ADB has recommended to PALYJA that it formalize and institutionalize the EMS according to the structure suggested in this appendix.

Figure A5.1: PT PAM Lyonnaise Jaya: Environmental Responsibilities



H. Framework for the Establishment of an Environmental Management System for PT PAM Lyonnaise Jaya

1. Introduction

1. As the concessionaire for water distribution in Western Jakarta, PALYJA is committed to ensure that its operations will not create adverse environmental and social impacts. In this regard, PALYJA will establish and effectively operate an appropriate EMS. PALYJA has committed to developing a structured and detailed EMS based on the following framework, which comprises the following elements: an overall policy objective for PALYJA, environmental assessment processes and procedures consistent with good practices in the water supply sector, formal organizational capacity, training opportunities, and monitoring and reporting mechanisms.

2. The framework is based on an understanding of (i) the extent PALYJA can manage environmental and social aspects of its business; and (ii) environmental and social impacts of water distribution.

2. Environmental Policy Framework

3. PALYJA will formulate an explicit corporate policy for the environmental and social management of its business. The EMS is a tool to ensure that the corporate environmental and social policy will be efficiently and effectively implemented by all its business units. This section proposes a policy statement and guiding principles for implementing the policy as part of the normal conduct of the business.

a. Policy Statement

4. The environment policy adopted by PALYJA should

(i) be relevant to activities;
(ii) comply with relevant environmental legislation and standards;
(iii) commit to the prevention of pollution;
(iv) commit to continual improvement;
(v) commit to setting environmental objectives and targets;
(vi) be known to employees and public; and
(vii) adopt, wherever and whenever possible, clean technologies in design, construction, and operation of water treatment and distribution facilities

b. Guiding Principles for Policy Implementation

6. The following guiding principles are suggested for implementation of PALYJA's environmental and social policy:

(i) PALYJA will avoid any construction on intensively inhabited land or on ecologically or socially sensitive areas. Examples of such sensitive areas are cultural sites and swamp forests.
(ii) PALYJA will ensure that the land, if any, provided by the local government have no pending issues with the former occupants related to compensation and resettlement assistance.

(iii) PALYJA will review the project environmental impact assessment and the recommended environmental management system (EMS) to identify gaps or inadequacies that could undermine environmental and social integrity of the project. If such inadequacies are found, PALYJA will initiate dialogue with relevant agencies on measures to improve the environmental impact assessment and EMS.
(iv) PALYJA will review the detailed designs and specifications prepared by the engaged design institutes or firms to ensure that they are environmentally sound and fully comply with the EMS.
(v) PALYJA will include in the construction contracts appropriate environmental and social management clauses related to the EMS, and ensure that the contractors fully comply with the environmental and social management clauses and applicable rules and regulations of the national and local governments.
(vi) PALYJA will fully comply with the monitoring and reporting requirements during construction as prescribed in the EMS and in compliance with applicable national and local laws and regulations.
(vii) PALYJA will fully comply with monitoring and reporting requirements during the operation of project facilities as prescribed in the EMS in compliance with applicable national and local laws and regulations.
(viii) PALYJA will report on its environmental and social management activities as set out in the EMS and as part of its annual reports.
(ix) PALYJA will implement an appropriate public information program related to its environmental and social management activities.
(x) PALYJA will continue to be an active partner of the communities in which it operates.

3. EMS Design Framework

a. EMS Elements and Activities

7. The EMS elements will be in line with the four main tasks of management: Plan, Do, Check, Act. These elements involve different activities during construction and operation of a project.

b. Work Processes and Procedures

8. In setting up the EMS, PALYJA should establish clear work processes and procedures or guidelines for all tasks**,** including

(i) review of environmental impact assessment, EMS, and detailed designs prepared by the engaged design institutes or firms and approved by the local governments as necessary;
(ii) changes or modifications of the EMS and detailed designs;
(iii) review of the environmental and social management plan of the contractors' proposals;
(iv) preparation and incorporation of environmental and social management clauses in the construction contracts;
(v) audit of environmental and social management compliance during the construction and operation of the treatment plants, and rectification of noncompliance and partial compliance; and
(vi) reporting of corporate environmental and social performance.

c. Organization

9. PALYJA should have one designated manager for environmental and social management to operate the EMS, supported by professional assistants as required. The manager should report directly to the president director. Environmental and social management activities should be carried out as part of routine plant operations. The results of environmental and social management should be reviewed, evaluated, and reported separately from those of the normal treatment plant operations. Regular training opportunities should be developed for PALYJA technical, environment, and social management staff to inform them of required environment and social management-related procedures, recent developments, and good practices in the industry to mitigate the environmental impact of PALYJA operations.

d. Budgeting

10. Expenses incurred in environmental and social management at the plant level should be included in the budget for operation of the treatment plants. Expenses incurred in environmental and social management at the corporate level, including training, will be part of the corporate overhead expenses.

LAND ACQUISITION AND RESETTLEMENT FRAMEWORK

A. Objectives

1. The resettlement framework defines the policies, procedures, roles, and responsibilities of PT PAM Lyonnaise Jaya (PALYJA) for screening and managing involuntary resettlement. PALYJA prepared the framework as part of its commitment to complying with the safeguard policies of the Asian Development Bank (ADB), in particular the *Involuntary Resettlement Policy* (1995).

B. Scope of Involuntary Resettlement in PALYJA Operations

2. PALYJA is a subsidiary of SUEZ Environment (SUEZ) of France and is one of the largest water service providers in Indonesia. PALYJA entered into a 25-year cooperation agreement with the Government commencing on 1 February 1998. The scope of services under the agreement includes the design, construction, refurbishment, and operation of the water supply system, technical and quality control, human resources and training, financing of new works, and billing and collection. Most of the activities involve upgrading or operating long-established facilities. These activities will not have involuntary resettlement impacts.

1. Temporary Disturbance and Mitigation Measures

3. Temporary disturbances are caused by the construction of distribution pipelines, for which PALYJA has established separate procedures, including (i) minimizing community disruption, (ii) assessing relevant utility impact, (iii) cleaning after construction, (iv) controlling drainage and sediment on-site, (v) maintaining traffic, and (vi) controlling noise.

4. For consultation, disclosure, and grievances, PALYJA manages its territory through three service units. Each unit (south, west, and central) has a dedicated public relations team to undertake community meetings/socialization of PALYJA projects. About 2 weeks before the project starts, the team and the contractor contact the head of RT&RW, the lowest administrative unit in the city, to conduct meetings regarding new projects, network rehabilitation, or tariff adjustment.

5. During the meeting, PALYJA presents information about the project such as time frame, objective, location, and responsibility for project implementation, including the names of the contractor and related units in PALYJA. For complaints when the work is being undertaken, the community may contact either the contractor or related units in PALYJA. As most of the population within the community will benefit from the new water pipelines by becoming customers, they may contact the PALYJA call center after they have connected to the pipelines. The call center provides 24-hour service, records all complaints, and then dispatches them to related units through an online system. After the complaint is resolved, the related unit will provide feedback to the call center.

2. Design and Right-of-Way Agreements

6. In the rare instances where the pipeline has to go through private or commercial land, the PALYJA process includes the following: (i) Prepare a draft design of the pipeline to be discussed with the landowner. (ii) When the landowner permits PALYJA to pass through the land, PALYJA prepares cost estimates for the compensation fee based on the agreement with the landowner. The landowner can negotiate the fee structure until both parties are satisfied with the result. Commercial land usually has its own regulation for land rental, and PALYJA will

follow that regulation as long as it is reasonable and does not conflict with PALYJA's own regulation. Upon reaching an agreement, PALYJA will prepare a contract for the duration of the concession. (iii) If the landowner will not permit PALYJA to pass through the land, PALYJA will seek alternative routes based on considerations for general site condition and hydraulic aspects.

7. PALYJA will not, to the best of its ability, be involved directly in land acquisition or resettlement in its future operations. However, this resettlement framework will set out the procedures, roles, and responsibilities for ensuring that PALYJA fully complies with ADB's involuntary resettlement safeguard requirements in the unlikely event that involuntary resettlement or land acquisition takes place.

3. Definitions

8. For the purpose of this framework, the following definitions will apply:

(i) Involuntary resettlement refers to social and economic impacts that are permanent or temporary and are caused by (a) acquisition of land and other fixed assets, (b) change in the use of land, or (c) restrictions imposed on land as a result of a PALYJA-funded investment.

(ii) Affected person includes any people, households, firms, or private institutions who, on account of changes that result from the project will have their (a) standard of living adversely affected; (b) right, title, or interest in any house, land (including residential, commercial, agricultural, forest, and/or grazing land), water resources, or any other moveable or fixed assets acquired, possessed, restricted, or otherwise adversely affected, in full or in part, permanently or temporarily; and/or (c) business, occupation, place of work or residence, or habitat adversely affected, with or without displacement.

4. Policy Framework

9. PALYJA will ensure that any involuntary resettlement activities are conducted in accordance with the following:

(i) ADB's *Involuntary Resettlement Policy* (1995); and
(ii) applicable national and provincial laws and regulations governing land acquisition, compensation and resettlement, and consultation and disclosure of resettlement information.

10. The objectives for managing involuntary resettlement impacts are to

(i) avoid involuntary resettlement wherever feasible,
(ii) minimize resettlement where population displacement is unavoidable, and
(iii) ensure that affected persons receive assistance so that they will be at least as well off as they would have been in the absence of the project.

11. Resettlement plans will pay particular attention to addressing the needs of the poorest affected people and vulnerable groups that may be at high risk of impoverishment.

12. Presidential decree (Keppres) No. 55/19932 on Land Acquisition specifies grievance procedures for landowners; defines "public interest" for development purposes; separates

private projects that should use regular land purchase arrangements; places increased emphasis on community consultation and reaching agreement with people affected regarding the form and amount of compensation; and presents options for compensation including substitute land, resettlement, and cash. The Regulation of the State Minister of Agrarian Affairs and National Land Agency No. 1 of 1994 specifies that each provincial governor should establish a land acquisition committee (Panitia Pengadaan Tanah) in each kabupaten (regency/district) and kota (municipality) to be chaired by the bupati or walikota, and compensate people using land without any title (Art. 20). The land acquisition committee includes representatives of the level II land office, tax office, public works agency, agriculture agency, heads of the subdistrict and villages where land acquisition will take place, and two additional members. Compensation is provided at the same replacement rates to all people affected including holders of hak adapt or ulayat (customary rights), and to long-term squatters on government land. Table A6.1 provides a comparison of ADB and Indonesian regulations.

5. Screening for Involuntary Resettlement Impacts

13. For any planned investment activities, PALYJA's senior officer (para. 19) responsible for social and resettlement performance will determine and seek consent from ADB on whether any activities to be undertaken (i) have historically involved land acquisition or involuntary resettlement; or (ii) may involve future involuntary resettlement.

a. Activities with No Involuntary Resettlement Impact

14. Where no involuntary resettlement impacts are indicated, no action with regard to this resettlement framework will be required.

b. Activities with Historical Involuntary Resettlement Impacts

15. In case of land acquisition or involuntary resettlement[50] prior to PALYJA's involvement, PALYJA's senior officer responsible for social and resettlement performance will ensure a resettlement due diligence report is prepared. The report should provide (i) a brief history of site land acquisition and resettlement, and parties responsible for implementation; (ii) details of affected land, population, and assets; (iii) assessment of outcomes with respect to restoration of standards of living and livelihood; and (iv) information on any outstanding resettlement grievances or related areas of reputation risk. It should state if a resettlement plan is required to define actions to achieve compliance with ADB's resettlement requirements.

c. Activities with Planned Involuntary Resettlement

16. In the event that any activities may involve involuntary resettlement, PALYJA's senior officer responsible for social and resettlement performance will

(i) assess the magnitude of resettlement, and in consultation with ADB, determine whether a short or full resettlement plan is required;
(ii) review relevant ADB policies and guidelines;
(iii) ensure that resettlement information is disclosed to those affected in accordance with ADB's safeguard requirements;
(iv) submit the draft resettlement plan to ADB for review and approval;

[50] Historical impacts for which resettlement due diligence will be required will be limited to projects for which land acquisition or relocation of people (whichever occurred most recently) occurred less than 3 years ago.

(v) oversee any revisions required by ADB to finalize the resettlement plan;
(vi) verify local disclosure of the final resettlement plan;
(vii) submit the final resettlement plan for website disclosure and ADB Board approval;
(viii) confirm ADB Board approval before proceeding with the investment
(ix) monitor implementation of the resettlement plan; and
(x) prepare and circulate monitoring reports as required under the approved resettlement plan.

d. Resettlement Plans

17. Where necessary, PALYJA will prepare a short or full resettlement plan, depending on the magnitude and complexity of resettlement. A full resettlement plan will be required when involuntary resettlement is "significant," i.e., when 200 or more people will experience major impacts. This is defined as (i) being physically displaced from housing, or (ii) losing 10% or more of productive assets (income generating). The terms of reference for drafting the resettlement plan are presented in paras. 22–41.

18. An entitlement matrix summarizing the compensation and entitlement policy is shown in Table A6.2.

4. Disclosure, Consultation, and Grievance Redress

19. Each resettlement plan will be prepared and implemented in close consultation with those affected, and involve surveys and community meetings. Plans in the Bahasa language will be made available to the public through postings in public places for reasonable periods of at least 4 months prior to actual land acquisition. ADB will review and approve the resettlement plans as they are prepared, and once finalized will disclose them on its website. Complaints and grievance procedures acceptable to ADB will be established in each resettlement plan.

5. Reporting, Monitoring, and Evaluation

20. PALYJA will nominate an experienced senior officer to be responsible for social and resettlement performance. The senior officer will be placed in the Operations Department and report directly to the president. The officer will be responsible for social and resettlement performance, specifically in (i) screening projects for involuntary resettlement impacts; (ii) familiarize with ADB's involuntary resettlement procedures and requirements; (iii) monitoring resettlement; and, (iv) reporting.

21. PALYJA will submit an annual report of performance monitoring against safeguard policies, and upon and after project completion.

Table A6.1: Comparison of ADB and Indonesian Regulations

No	Category	ADB Policy	Perpres 36/2005	Keppres 55/1993
1.	Compensated item	Lost of fixed or moveable assets Loss of livelihood Loss of income Loss of income opportunity or business Loss of access to resources	Rights to the land (Art. 12) Structures (Art. 12) Plants (Art. 12) Other objects connected to the land (Art. 12)	Rights to the land (Art. 12) Structures (Art. 12) Plants (Art. 12) Other objects connected to the land (Art. 12)
2.	Form of compensation	Compensation for lost assets /access Compensation for loss of livelihood Compensation for loss of income Assistance for relocation Assistance for social and economic rehabilitation	Cash; (Art. 13) Replacement land; (Art. 13) Resettlement (Art. 13) Compensation through provision of securities/share as regulated by the law if the owners do not want compensation form as stated above (Art. 13) Development of social facilities or other forms useful for the communities for compensation of communal lands (Art. 14)	Cash (Art. 13) Replacement land (Art. 13) Resettlement (Art. 13) Combination of the options above (Art. 13) Other (compensation) forms agreed by the concerned parties (Art. 13) Development of social facilities for compensation of communal lands (Art. 14)
3.	Entitled person for compensation and rehabilitation	Any people, household, firm, or private institution that on account of changes resulting form the project will have their (i) standard of living adversely affected, (ii) right, title, or interest in any house land (including residential, commercial, agricultural, forest, and/or grazing land) water resources, or any moveable or fixed asset acquired possessed, restricted, or otherwise adversely affected in full or in part, permanently or temporarily; and/or (iii) business occupation, place of work or residence, or habitat adversely affected with or without displacement. The absence of a formal legal title to land is not a bar to ADB policy entitlements	Holder of the land rights or his/her legal/valid heirs (Art. 16) The nadzir for wakaf land[a] (Art. 16)	Holder of the land rights or his/her legal/valid heirs (Art. 17) The nadzir for wakaf land (Art. 17)

No	Category	ADB Policy	Perpres 36/2005	Keppres 55/1993
4.	Information disclosure and consultation process	Those affected should be fully informed and closely consulted on resettlement and compensation options	Release of land rights…through compensation based on consultation (Art. 1, item 6) The forms and value of the compensation are settled in the consultation meeting (Art. 8)	The forms and value of the compensation are settled in the consultation meeting (Art. 16)
5.	Institution	The Government and project institutions	Land Provision Committee established to support land provision for public interest development activity (Art. 1, item 9) Independent land price evaluation team (Art. 15, item 2)	Land Provision Committee (Art. 6)
6.	Basis for settling the compensation value	…to achieve at least the same level of well-being with the project as without it. All compensation is based on the principle of replacement cost	Consultation is a process…to reach agreement on compensation value and forms related to the land provision activity based on free will and equality between landowner and land inquirer. (Art 1, item 10) Compensation means replacement of the loss, either physical or nonphysical, due to land, plant, or structure acquisition related to the land, which could provide better social and economic life than before the land acquisition (Art. 1, item 11) For land, the "real" land price, refers to the latest NJOP[b] based on the decision made by the price evaluation team assigned by the Land Provision Committee (Art. 15) For structures, selling value of the structures determined by local government institution responsible for structure development (Art. 15) For plants, estimation value determined by local government institution responsible for the agriculture sector (Art. 15)	For land, the "real" land price, refers to the latest NJOP[b] (Art. 15) For structures, selling value of the structures determined by local government institution responsible in structures development (Art. 15) For plants, estimation value determined by local government institution responsible on agriculture sector (Art. 15)
7.	Measure for unsettling compensation agreement	Grievance mechanism should be clearly defined	Landowners may appeal to the governor if he/she cannot accept the decision with reasons provided (Art. 17)	Land acquisition committee will decide the value and form of the compensation considering the opinions, aspirations, and suggestions given in the consultation meetings (Art. 19)

No	Category	ADB Policy	Perpres 36/2005	Keppres 55/1993
			The governor may decide to change or affirm the decision made by the land acquisition committee (Art. 17) If the governor's decision still cannot be accepted by the owners and the location of the development activity cannot be changed, the governor will propose to use the Indonesian law No. 20/1961 on the revocation of land rights and other objects above it. (Art. 17)	Landowners may appeal to the governor if he/she cannot accept the decision with reasons provided (Art. 20) The governor may decide to change or affirm the decision made by the land acquisition committee (Art. 20) If the governor's decision still cannot be accepted by the owners and the location of the development activity cannot be changed, the governor will propose to use Indonesian law No. 20/1961 on the revocation of land rights and other objects above it. (Art. 21)
8.	Scope of activities	Public sector project loans, program loans, sector loans, sector development program loans, financial intermediation loans, private sector loans, or equity investments and guarantees for funding of specific project or subprojects, and all project components regardless of the sources of financing	Public roads, toll roads, drainage, railways (sub- and above terrain or basements), drinking water pipes), sewage water and sanitation, dams, irrigation system and building facilities, public hospitals and community health centers, ports, airports, bus terminals, religious places, education facilities and schools, public market place, cemeteries, natural disaster safety facilities, post and telecommunications, sport facilities, radio and television stations and supporting facilities, government offices, foreign representative offices, United Nations or other international agencies under auspices of United Nations, Indonesian military facilities, prisons, inexpensive apartment houses, garbage dumps, natural and cultural conservation areas, park areas, social institutions, power plants, transmission and distribution facilities (Art. 5)	Public roads, drainage, dams, irrigation system and building facilities, public hospitals and community health centers, ports, airports, bus terminals, religious places, education facilities and schools, public market places, cemeteries, natural disaster safety facilities, post and telecommunications, sport facilities, radio and television and supporting facilities, government offices, Indonesian military facilities (Art. 5)
9.	Small-scale land acquisition	No differentiation with large land acquisition and resettlement	Land provision for development of public interest facilities that covers less that 1 hectare could be done directly by the concerned government institution with the owners of the lands through direct purchase or exchange or other measure agreed by both parties. (Art 20)	Land provision for development of public interest facilities that cover less that 1 hectare could be done directly by the concerned government institution with the owners of the lands through direct purchase or exchange or other measure agreed by both parties. (Art. 23)

ADB = Asian Development Bank, Keppres = ministerial decree, Perpres = presidential decree. .

[a] Nadzir refers to cash/fund manager for Wakaf land, which is a land donated for religious or community use.

[b] Nilai Jual Wajib Pajak refers to taxable value of property.

C. Draft Terms of Reference for Elaboration of Land Acquisition and Resettlement Plan

22. The scope and detail of the resettlement plan vary with the magnitude and complexity of resettlement. The plan is based on up-to-date and reliable information about (i) the proposed project and its impacts on affected groups, and (ii) the legal issues involved in resettlement. The plan includes relevant elements. When any element is not relevant to project circumstances, it should be noted in the resettlement plan.

23. **Project Description.** Provide a general description of the project and identify project area.

24. **Potential Impacts.** Identify (i) project components or activities that result in resettlement; (ii) impact zone of such activities; (iii) alternatives considered to avoid resettlement; and (iv) mechanisms to minimize resettlement, to the extent possible, during project implementation.

25. **Objectives.** Provide the main objectives of the resettlement program.

26. **Socioeconomic Studies.** Provide the findings of socioeconomic studies to be conducted in the early stages of project preparation and with the involvement of potentially affected people, including

- (i) results of a census survey covering
  - (a) current occupants of the affected area to establish a basis for design of the resettlement program and to exclude subsequent inflows of people from eligibility for compensation and resettlement assistance;
  - (b) standard characteristics of affected households, including a description of production systems, labor, and household organization; and baseline information on livelihoods (including, as relevant, production levels and income derived from both formal and informal economic activities) and standards of living (including health status) of those affected;
  - (c) the magnitude of the expected loss, total or partial, of assets, and the extent of physical or economic displacement;
  - (d) information on vulnerable groups or people, for whom special provisions may have to be made; and
  - (e) provisions to update information on the livelihoods and standards of living of those affected at regular intervals so that the latest information is available at the time of their displacement; and
- (ii) other studies describing the following
  - (a) land tenure and transfer systems, including an inventory of common property natural resources from which people derive their livelihoods and sustenance, non-title-based usufruct systems (including fishing, grazing, or use of forest areas) governed by local recognized land allocation mechanisms, and any issues raised by different tenure systems in the project area;
  - (b) patterns of social interaction in the affected communities, including social support systems, and how they will be affected by the project;
  - (c) public infrastructure and social services that will be affected; and
  - (d) social and cultural characteristics of affected communities, including a description of formal and informal institutions (e.g., community organizations, ritual groups, nongovernment organizations [NGOs]), that may be relevant to the consultation strategy and to designing and implementing the resettlement activities.

27. **Legal Framework.** Include the findings of an analysis of the legal framework, covering

(i) scope of the power of eminent domain and the nature of compensation associated with it, in terms of both the valuation methodology and the timing of payment;
(ii) applicable legal and administrative procedures, including a description of the remedies available to displaced persons in the judicial process and the normal time frame for such procedures, and any available alternative dispute resolution mechanisms that may be relevant to resettlement under the subproject;
(iii) relevant law (including customary and traditional law) governing land tenure, valuation of assets and losses, compensation, and natural resource usage rights, customary personal law related to displacement, and environmental laws and social welfare legislation;
(iv) laws and regulations relating to the agencies responsible for implementing resettlement activities;
(v) gaps, if any, between local laws covering eminent domain and resettlement and ADB's resettlement policy, and the mechanisms to bridge such gaps; and
(vi) any legal steps necessary to ensure effective implementation of resettlement activities under the project, including, as appropriate, a process for recognizing claims to legal rights to land, including claims that derive from customary and traditional usage.

28. **Institutional Framework**. Include the findings of any analysis of the institutional framework covering

(i) identification of agencies responsible for resettlement activities and NGOs that may have a role in project implementation;
(ii) assessment of the institutional capacity of such agencies and NGOs; and
(iii) steps proposed to enhance the institutional capacity of agencies and NGOs responsible for resettlement implementation.

29. **Eligibility.** Define affected persons and criteria for determining their eligibility for compensation and other resettlement assistance, including relevant cut-off dates.

30. **Valuation of and Compensation for Losses.** Describe the methodology to be used in valuing losses to determine replacement cost, proposed types and amount of compensation under local law, and supplementary measures necessary to achieve replacement cost for lost assets.

31. **Resettlement Measures.** Describe the compensation packages and other resettlement measures to be provided to each category of eligible displaced people to achieve the objectives of ADB's resettlement policy. In addition to being technically and economically feasible, the resettlement packages should be compatible with the cultural preferences of the displaced people, and prepared in consultation with them.

32. **Site Selection, Site Preparation, and Relocation**: Identify alternative relocation sites considered and explain those selected, covering

(i) institutional and technical arrangements for identifying and preparing relocation sites, whether rural or urban, for which a combination of productive potential, location advantages, and other factors is at least comparable to the advantages of

the old sites, with an estimate of the time needed to acquire and transfer land and ancillary resources;

(ii) any measures necessary to prevent land speculation or influx of eligible people at the selected sites;

(iii) procedure for physical relocation under the project, including timetables for site preparation and transfer; and

(iv) legal arrangements for regularizing tenure and transferring titles to resettlers.

33. **Housing, Infrastructure, and Social Services.** Outline plans to provide (or to finance resettler's provision of) housing, infrastructure (e.g., water supply, feeder roads) and social services to host populations; and any necessary site development, engineering, and architectural designs for these facilities.

34. **Environmental Protection and Management**. Describe the boundaries of the relocation area, assess the environmental impacts of the proposed resettlement, and describe measures to mitigate and manage these impacts (coordinated as appropriate with the environmental assessment of the main investment requiring the resettlement).

35. **Community Participation.** Describe the strategy for consultation with and participation of resettlers and host communities, including

(i) the strategy for consultation with and participation of those affected and host communities in the design and implementation of resettlement activities;

(ii) a summary of the views expressed and how these views were taken into account in preparing the resettlement plan;

(iii) a review of the resettlement alternatives presented and choices made by displaced people regarding options available to them, including choices related to forms of compensation and resettlement assistance, to relocating as individual families or as parts of preexisting communities or kinship groups, to sustaining existing patterns of group organization, and to retaining access to cultural property (e.g., places of worship, pilgrimage centers, cemeteries); and

(iv) arrangements by which displaced people can communicate their concerns to project authorities throughout planning and implementation, and measures to ensure that such vulnerable groups as indigenous people, ethnic minorities, landless, and women are adequately represented.

36. **Integration with Host Population.** Describe measures to mitigate the impact of resettlement on any host communities, including

(i) consultations with host communities and local governments,

(ii) arrangements for prompt tendering of any payment due the hosts for land or other assets provided to those affected,

(iii) arrangements for addressing any conflict that may arise between those affected and host communities, and

(iv) any measures necessary to augment services (e.g., education, water, health, and production services) in host communities to make them at least comparable to services available to those affected before the project.

37. **Grievance Procedures.** Provide accessible procedures for third-party settlement of disputes arising from resettlement. Such grievance mechanisms should take into account the availability of judicial recourse, and community and traditional dispute settlement mechanisms.

38. **Organizational Responsibilities.** The framework for implementing resettlement, including identification of agencies responsible for delivery or resettlement measures and provision of services; arrangements to ensure appropriate coordination between agencies and jurisdictions involved in implementation; any measures (including technical assistance) needed to strengthen the implementing agencies capacity to design and carry out resettlement activities; and provisions for the transfer to local authorities or affected people themselves responsibility for managing facilities and services provided under the project and for transferring other such responsibilities from the resettlement implementing agencies, when appropriate.

39. **Implementation Schedule.** Provide an implementation schedule covering all resettlement activities from preparation through implementation, including target dates for achieving expected benefits to resettlers and hosts and terminating the various forms of assistance. The schedule should indicate how the resettlement activities are linked to implementation of the overall project.

40. **Costs and Budget.** Include tables showing itemized cost estimates for all resettlement activities, including allowances for inflation, population growth, and other contingencies; timetable for expenditures; sources of funds; arrangements for timely flow of funds; and funding for resettlement, if any, in areas outside the jurisdiction of the implementing agencies.

41. **Monitoring and Evaluation.** Provide arrangements for monitoring of resettlement activities by the implementing agency, supplemented by independent monitors as considered appropriate by ADB, to ensure complete and objective information; performance monitoring indicators to measure inputs, outputs, and outcomes for resettlement activities; involvement of those affected in the monitoring process; and evaluation of the impact of resettlement for a reasonable period after all resettlement and related development activities have been completed. Use the results of resettlement monitoring to guide subsequent implementation.

Table A6.2: Entitlement Matrix

Affected Asset	Type of Loss	Entitlement	Expected Results
Customary Land	Permanent loss	• Cash compensation based on the market value of the affected land and provision of all legal and other expenses associated with it • If the remaining portion of the affected land is not viable for continuous use: cash compensation for the entire piece of land, assistance to find a similar lands, and all transaction costs associated with the transfer	Livelihood restoration
		Assistance to find a similar piece of land and provision of the transaction costs	Livelihood restoration
	Temporary loss	Lease agreement: after the use, the land will be restored to its original condition or improved quality and returned to the owner	Livelihood restoration
Commercial Land	Permanent loss	Assistance to find a similar piece of land and provision of the transaction costs	Livelihood restoration
	Temporary loss	A negotiated lease: after the use, the land will be restored to its original condition or improved quality and returned to the landowner	Livelihood restoration
Access to Common Property	Permanent loss	An alternative access and an easement fee: all impacts associated with this alternative access will be addressed accordingly	Pay respect to customs
	Temporary loss	Alternative access (bypasses, etc.) or if this is found to be impossible an easement fee and the access will be restored up to a condition that is equal or better then before the project	Livelihood restoration
Structures (residential or commercial)	Partial or total removal of structure	• Cash compensation amounting to the full replacement cost • Relocation assistance in cash and in kind • Moving allowance equal to 2-months income • All materials salvaged from demolished structures remain the property of owner of the structure	Livelihood restoration
		Assistance to find a similar structure of equal or higher quality at a similar price	Livelihood restoration

FINANCIAL ANALYSIS

1. The financial evaluation of the Project was carried out on an incremental and after-tax basis, assuming that (i) investments will be undertaken from 2008 to 2012, and cash flows related to these investments commence by mid 2008; (ii) the analysis is until the end of the concession period, which is 2022, and no salvage value is assumed (this is a conservative assumption); (iii) all the prices are in constant 2007 values in the local currency; and (iv) revenues are adjusted for inflation. The projected volume of additional water supplied due to the Project is 54.4 million cubic meters (m^3).

2. The weighted average cost of capital for PT PAM Lyonnaise Jaya (PALYJA) is estimated at 4.19% on an after-tax basis in real terms. Table A7.1 shows the weighted average cost of capital from the various sources.

Table 7.1: Weighted Average Cost of Capital

	Financing Component (RP million)		
Item	**ADB Loan**	**PALYJA Bond Issue**	**Equity and Others**
Amount	455,000	475,000	455,000
Weighting	32.85%	34.30%	32.85%
Nominal Cost	12.70%	13.25%	16.38%
Tax Rate	30.00%	30.00%	0.00%
Tax Adjusted Nominal Cost	8.89%	9.28%	16.38%
Inflation Rate	7.00%	7.00%	7.00%
Real Cost	1.77%	2.13%	8.77%
Weighted Component of WACC	0.58%	0.73%	2.88%
WACC	4.19%		

ADB = Asian Development Bank, PALYJA = PT PAM Lyonnaise Jaya, WACC = weighted average cost of capital.
Source: Asian Development Bank estimates.

3. Table A7.2 shows the financial internal rate of return using the assumptions made as 12.8%. Sensitivity analysis was undertaken for the case of a cost overrun, higher operation and maintenance costs, lower water charge, and a combination of all. In all cases, the financial internal rate of return is well above the weighted average coast of capital (Table A7.2), demonstrating the financial viability of the Project under adverse scenarios.

Table A7.2: Sensitivity Analysis of Financial Internal Rate of Return

Sensitivity Parameter	***Percentage Change***	FIRR (%)
Base Case		12.8
(i) Cost Overrun	10	10.7
(ii) O&M Increase	10	10.2
(iii) Water Charge	(5)	10.3
(iv) Combination of (i)–(iii)		5.9

( ) = negative, FIRR = financial internal rate of return, O&M = operating and maintenance expenditure.
Source: Asian Development Bank estimates.

Table A7.3: Financial Internal Rate of Return

Year	Investment (Rp million)	O&M costs (Rp million)	Total Cost (Rp million)	Incremental Water Supply (Million cubic meters)	Water Charge (Rp/cu m)	Total Benefits (Rp million)	Net Benefits (Rp million)
2008	191,589	40,331	231,920	10.7	6,882	73,537	(158,383)
2009	192,157	71,190	263,346	19.9	6,882	136,861	(126,485)
2010	191,830	82,564	274,394	23.7	6,882	163,083	(111,310)
2011	204,456	94,283	298,739	27.6	6,882	190,055	(108,684)
2012	191,080	104,064	295,144	31.0	6,882	213,641	(81,504)
2013		139,073	139,073	34.3	6,882	236,398	97,325
2014		148,606	148,606	37.9	6,882	260,513	111,907
2015		158,266	158,266	41.6	6,882	286,097	127,831
2016		163,924	163,924	44.2	6,882	303,868	139,945
2017		168,554	168,554	46.5	6,882	319,979	151,424
2018		167,915	167,915	48.4	6,882	332,985	165,070
2019		170,802	170,802	50.2	6,882	345,672	174,870
2020		172,186	172,186	52.0	6,882	357,629	185,443
2021		173,517	173,517	53.2	6,882	366,304	192,786
2022		174,481	174,481	54.4	6,882	374,451	199,970
						FIRR	**12.8%**

FIRR = financial internal rate of return
Source: Asian Development Bank estimates.

ECONOMIC ANALYSIS

A. Introduction

1. The Project is to improve water supply services to existing customers and extend water supply to new customers in West Jakarta. PT PAM Lyonnaise Jaya (PALYJA) has a 25-year concession to produce and supply clean water in West Jakarta until 2022. The economic analysis examines the economic viability of the Project, following Asian Development Bank (ADB) guidelines: *Guidelines for the Economic Analysis of Projects* and *Handbook for the Economic Analysis of Water Supply Projects*. The analysis draws on information obtained from government agencies, the project developer, the water supply master plan, and other available secondary data.

B. Project Rationale and Description

2. In Indonesia only about 40 million people, or 18% of the population, are connected to piped water supply. In urban areas, only 39% of the population receives piped water. The remaining urban population depends on individual wells, small-scale providers, or water vendors, often at high cost.[51] Due to lack of enforcement of regulation on water discharges, groundwater quality has deteriorated over time. Piped water supply provided by utilities is clean and sustainable, as water quality is maintained through treatment prior to distribution and constant monitoring. The operations and quality control in such utilities are easier to regulate than that of supply from ground wells and water vendors in the informal sector.

3. Access to water supply in Jakarta (8.5 million inhabitants) is ensured through three alternatives:

(i) 55% piped water—4.7 million people
(ii) 30% shallow and deep wells—2.5 million people
(iii) 15% water vendors—1.3 million people

4. However, overexploitation of the aquifer through groundwater extraction is resulting in subsidence. In addition to increasing salt water intrusion, chemical and microbiological pollutants make the groundwater unfit for human use and consumption. Research undertaken by the Ministry of Environment indicates that 65% of groundwater in Jakarta is unsuitable for human use because of negative health impacts (for example, contaminated and untreated groundwater leads to several waterborne diseases such as diarrhea, typhus, cholera, and hepatitis A; and contamination from chemical substances, such as insecticide, can lead to carcinogenic ailments. As a result, clean water has to be bought from informal water street vendors at prices that are several times the cost of piped water supply.[52]

5. The land subsidence is also making the area prone to floods. Unfortunately, the flood-prone area is inhabited by low-income households. The Jakarta Mining Department will control further exploitation of groundwater in order to abate aggravated land subsidence. Groundwater is not therefore, an economically viable water supply option. The other alternative of purchasing water from vendors is a very expensive. Therefore, extension and improvement of the piped water distribution network is the least cost option for Jakarta.

[51] In rural areas, only about 15% of households receive drinking water from pipe or pump sources.
[52] A 20 liter can of water costs Rp500, which is equivalent to Rp25,000/cubic meter. Piped water tariffs range from Rp1,050/cubic meter (low-income households) to Rp9,693/cubic meter (small commercial establishments).

6. In 1997 when PALYJA obtained the concession for West Jakarta, water supply infrastructure was characterized by old and rusted pipes, bad connections, damaged valves, and decreased water pressure. The service coverage ratio was 32% and unaccounted for water was around 57%, due to illegal connections, physical losses, and meter tampering. In 2006, the service ratio increased to 55%. Water losses were reduced by 15% to 42% in 2003. However, due to lack of adequate investments, losses increased to 47.6% (23.8% physical losses, and 23.8% commercial losses) in 2006. Additional investments are required to reduce losses and increase the coverage ratio. The Project will invest in PALYJA's concession area to upgrade the production facilities; reinforce, rehabilitate, and extend the existing distribution network; reduce water losses; and rehabilitate existing connections and implement new ones. The investments undertaken during 2008–2012 will add 66,000 new customers and reduce water losses to 31% (19% physical losses and 12% commercial losses).

C. Economic Analysis

1. Demand for Water

7. On average, a customer demands 30 cubic meters of water per month when connected to the water network. With limited water available from the network, demand is restricted to a fraction (estimated to be about 10%–20%) of this, due to the very high cost of alternative sources, especially for low-income households. PALYJA projects that with the envisaged project investments, the number of customers will reach 452,230 by 2012, an increase of 66,000 compared to 2007 figures. In developing future customers, PALYJA is sensitive to providing services for low-income customers, ensuring that low-income areas are given priority for establishing new distribution networks and connections. Further, the water tariffs approved by the governor of Jakarta are set such that social and low-income customers pay less for water than high-income individuals and business entities. As a result, the number of low-income customers increased by 480% as compared with the 50% increase of middle- and upper-income customers since the beginning of the concession. The Jakarta government adjusts tariffs and cross-subsidizes various consumer categories to ensure that the average tariff is greater than or equal to the water charge paid to PALYJA.

2. Supply of Water

8. Jakarta's raw water supply mostly comes from surface water, of which 80% comes from the Citarum River, located east of Jakarta. The water is managed through several dams, including the Saguling, Cirata, and Jatiluhur dams. These dams are also used for electric power generation, river flow management, irrigation, tourism, and industrial purposes. The water is channeled for distribution through the West Tarum Canal. Another 15% comes from the Cisadane River, located west of Jakarta, and the remaining 5% from smaller rivers flowing from West Java Province to the Jakarta area, such as the Ciliwung, Krukut, and Pesanggarahan rivers. An increase in the water supply for urban use through the Project is not likely to impact other water uses if proper measures are employed to reduce wastage and improve the efficiency of the West Tarum Canal. This is being addressed by the proposed Integrated Citarum Water Resource Management Project from ADB public sector operations.

3. Economic Benefits and Cost Valuation

9. In the without-project scenario, 80%–90% of the demand is not met due to supply constraints and the very high price of alternatives. In the with-project scenario, the main quantifiable benefits are the increased supply of water and reduced physical losses of water.

Without the project, demand is constrained by the high price of alternatives. Most of the additional (new) water supply is therefore incremental and the benefits are valued at the customers' willingness to pay, which is measured by the water charge. The only viable alternative is vendor supplied water, which is expensive and thus demand is suppressed to only 10%. Therefore, only 10% of the additional volume of water sold is treated as nonincremental and valued at its opportunity cost. Commercial losses are valued at the water charge.

10. The economic analysis uses economic prices, with financial prices adjusted to net out transfer payments including taxes, duties, or subsidies, and corrected for any other market distortions. The following assumptions are used:

(i) The project analysis is done in constant 2007 prices.
(ii) The economic life of the Project is assumed to be until the end of the concession in 2022. The project investments will be implemented over 5 years from 2008 to 2012. No residual values are assumed in 2022, making the analysis a conservative estimation of net benefits.
(iii) The capital and operation and maintenance costs were apportioned into traded and nontraded components.
(iv) Using the domestic price numeraire, financial prices as reduced by duties and taxes were converted to economic prices by a shadow exchange rate factor of 1.1 for the traded cost component and 1.0 for the nontraded cost component.
(v) A conversion factor of 0.95 is used for the cost of unskilled labor to reflect the real market value of labor, based on the relationship between the minimum wage and reported actual rates received by unskilled workers in Jakarta.
(vi) Electricity prices are not adjusted as electricity is supplied to the Project at commercial rates, which reflect the cost of generation, transmission, and distribution.
(vii) Operation and maintenance costs are split into fixed (equipment and parts and skilled labor) and variable (chemicals, electricity, bulk/raw water) costs. Table A8.1 summarizes the economic costs for the Project.

11. Table A8.2 provides details on the increase in water supply due to the project investments, and the physical and commercial losses during water supply. In the economic analysis, the commercial losses of water are included in the calculation of the economic rate of return (EIRR). The EIRR for the base case is 58.5%.

12. The Project will also result in the following indirect benefits: (i) reduction in the extraction of groundwater thereby contributing to the control of further land subsidence; and (ii) reduction in the incidence of waterborne diseases, especially among the poor, made possible through the supply of clean water. These benefits have not been valued, but their inclusion will increase the Project's EIRR.

4. Sensitivity Analysis

13. An analysis was undertaken to test the sensitivity of the estimated EIRR of the Project to adverse changes in key variables and to confirm its economic viability under unfavorable conditions. For purposes of the analysis, three major risks are considered: (i) an increase of 10% in the capital and O&M costs, (ii) a 10% decrease in revenue, and (iii) underachievement of physical loss reduction by 50% of that originally planned. A scenario was also run with a combination of all the three risk factors. Table A8.3 shows the EIRR under different scenarios; in all cases the EIRR is above 30%.

Table A8.1: Project Costs
(Rp million)

Year	Investment	O&M costs									Total Cost
		Equipment and Spares	Direct Labor	Indirect Labor	Electricity	Chemical	RW and BW	Customer Service	Other	Total O&M	
2008	173,196		6,740	5,197	2,661	2,730	14,696	2,265	9,366	43,655	**238,536**
2009	173,709		11,520	8,884	4,808	5,009	25,855	4,105	16,695	76,876	**275,644**
2010	173,414		13,078	10,085	5,566	5,793	29,982	4,919	19,522	88,946	**288,596**
2011	184,828		14,786	11,402	6,361	6,641	34,071	5,740	22,336	101,336	**314,781**
2012	172,737		16,181	12,478	7,013	7,334	37,452	6,479	24,657	111,594	**312,764**
2013		27,085	17,452	13,457	7,613	7,972	40,564	7,185	25,573	146,902	**161,592**
2014		27,264	18,729	14,443	8,233	8,637	43,730	7,908	27,781	156,725	**172,397**
2015		27,329	20,016	15,435	8,876	9,332	46,957	8,645	30,053	166,643	**183,308**
2016		26,674	20,828	16,062	9,257	9,726	49,024	9,171	31,570	172,311	**189,542**
2017		25,910	21,570	16,634	9,595	10,070	50,923	9,669	32,912	177,283	**195,012**
2018		24,938	22,134	17,068	9,832	10,295	52,384	10,100	30,211	176,963	**194,660**
2019		23,953	22,665	17,478	10,051	10,502	53,772	10,526	31,156	180,103	**198,113**
2020		21,797	23,145	17,848	10,244	10,676	55,043	10,938	32,040	181,730	**199,902**
2021		20,725	23,461	18,092	10,338	10,736	55,899	11,281	32,685	183,217	**201,538**
2022		19,675	23,745	18,310	10,415	10,775	56,680	11,603	33,120	184,323	**202,755**

RW and BW = raw water and bulk water, O&M = operations and maintenance.
Source: Asian Development Bank estimates.

Table A8.2: Economic Internal Rate of Return

Year	Total New Demand	Physical Losses	Commercial losses	Total Losses	Total Water Consumed	Water Charge	Vendor Price	Total Benefits	Net Benefits
	million m^3	million m^3	million m^3	million m^3	million m^3	Rp/m^3	Rp/ m^3	Rp million	Rp million
2008	10.7	4.6	4.6	9.1	**15.2**	6,882	25,000	**124,217**	**(88,132)**
2009	19.9	8.1	7.9	15.9	**27.8**	6,882	25,000	**227,144**	**(15,668)**
2010	23.7	9.1	8.7	17.9	**32.4**	6,882	25,000	**266,101**	**12,555**
2011	27.6	10.2	9.8	20.0	**37.4**	6,882	25,000	**307,264**	**30,935**
2012	31.0	11.0	10.5	21.6	**41.6**	6,882	25,000	**342,304**	**68,578**
2013	34.3	11.7	11.2	22.9	**45.5**	6,882	25,000	**375,462**	**242,218**
2014	37.9	12.4	11.8	24.2	**49.6**	6,882	25,000	**410,235**	**267,758**
2015	41.6	13.1	12.4	25.5	**54.0**	6,882	25,000	**446,783**	**294,944**
2016	44.2	13.3	12.6	25.9	**56.8**	6,882	25,000	**470,684**	**313,322**
2017	46.5	13.8	12.3	26.2	**58.8**	6,882	25,000	**489,210**	**327,307**
2018	48.4	14.1	11.9	26.1	**60.3**	6,882	25,000	**502,611**	**341,001**
2019	50.2	14.5	11.4	25.9	**61.6**	6,882	25,000	**515,234**	**350,757**
2020	52.0	14.7	10.9	25.6	**62.8**	6,882	25,000	**526,505**	**360,542**
2021	53.2	14.9	10.2	25.0	**63.4**	6,882	25,000	**532,767**	**365,446**
2022	54.4	15.0	9.5	24.4	**63.9**	6,882	25,000	**538,153**	**369,821**
								EIRR	**58.5%**

EIRR = economic internal rate of return, m^3 = cubic meter, Rp = rupee.
Source: Asian Development Bank estimates.

Table A8.3: Sensitivity Analysis of Economic Internal Rate of Return

Sensitivity Parameter		***Percentage Change***	EIRR (%)
Base Case			58.5
(i)	Increase in capital and O&M costs	+10	44.9
(ii)	Decrease in revenue	-10	46.7
(iii)	Underachievement of physical loss reduction	-50	53.1
(iv)	Combination of (i)–(iii)		32.7

EIRR = economic internal rate of return, O&M = operation and maintenance.
Source: Asian Development Bank estimates.

14. The economic analysis and sensitivity analysis confirm that the Project is sustainable with a base case EIRR of 58.5%. The Project is justifiable in economic terms.

D. Distribution of Project Benefits

15. An assessment by an independent regulatory body established in 2001 to monitor implementation of the concession agreement shows that in Jakarta's low-income areas poor people are currently spending a significant share of their household budget to buy water from informal vendors, this price is far greater that what they would pay once connected to the network. The Project will directly benefit more than 66,000 households, with a high proportion in the lower income categories. The Project will have a marginal impact on employment generation, which is limited to workers (skilled and unskilled) employed for the expansion of the distribution network.

16. Project benefits will accrue to the project developers and all categories of consumers in terms of lower priced water supply that is more reliable and cleaner than the alternatives. Further given the tariff structure adopted by the Jakarta government, the poor consumers are cross-subsidized by the higher income category consumers. However, the higher prices paid for piped water by the higher income category is lower than those paid for alternative sources. The vendors of water will be adversely affected by the Project as they will lose part of their business. As only a few vendors are reaping supernormal rents in the without-project scenario, the gains by a multitude of consumers not only in terms of access to less expensive water supply but also lower health expenditure and overall well-being exceed the loss for the vendors.