

8. 本格調査実施の方向性

8.1 基本方針

以下の項目を基本方針として調査を実施する。

- (1) 地方部の BHN を満たすため、緊急的に改善が必要な範囲で計画を策定する。
- (2) 将来の維持管理を考慮し、極力簡易な施設とする。また、必要な技術協力について提言を行う。
- (3) 現地の事情を考慮したうえで、適切な水質検査を行うための機材の調達を計画に含め、必要な人員配置について提言を行う。
- (4) Lorengau
 - 1) 現行のシステムが水理的に不合理であり、この改善に留意するとともに、取水位置の決定にあたっては塩水遡上を考慮して検討する。
 - 2) 料金徴収システムを今後立ちあげる必要があり、Waterboard と組織、制度、時期等入念な打合せが必要である。また、今後の水道事業の sustainability を確認する。
 - 3) 将来の住宅・観光開発等の計画があるが、計画する配管網の範囲はあくまでも現状を踏まえることとする。
- (5) Goroka
 - 1) 既存施設の能力を適切に評価し、緊急的に改善が必要な範囲内でも計画内容とする。
 - 2) 取水施設は既存施設の補修程度とし、付近の住民による汚染防止対策等についても必要最小限のものとする。
 - 3) 配管網においては、アスベスト管は全面交換とし、その他の部分で改善が必要な部分については先方負担とする。維持管理及びその他自助努力で行うべき事項に係る費用を概算し、先方に確保を求める。

8.2 必要な調査項目と確認事項

(1) 基本的事項

施設諸元を決定や建設後の維持管理体制等の基本的確認事項を次の表 8.1 にとりまとめた。

表 8.1 本格調査時での確認事項

ローレンガウ水道計画	ゴロカ水道計画
① Waterboard ローレンガウ事業所設立、従業員配置、必要備品等 PNG 側ポーシヨンの予算化時期	① 水需要予測のための基準確認
② 施設の目標年次	② 施設の目標年次
	③ 既存浄水場ろ過砂取替え時の粒度
	④ 取水・導水路部分の法的位置付けの確認

(2) 技術的調査内容

基本設計調査の現地調査期間並びに日本国内調査期間内に実施されるべき技術的調査内容を表 8.2 にとりまとめた。現地調査期間内に実施すべき項目のうち、測量、水質試験、簡易人口調査は現地業者または傭人にて実施可能である。また、各調査段階に実施される業務は表 8.3 のとおりにまとめられる。

表 8.2 本格調査に必要な調査内容

	ローレンガウ水道計画	ゴロカ水道計画
水需要量	①簡易人口確認調査からの水需要予測	①簡易人口確認調査水需要予測
取水施設	①河川縦横断・取水地点概略測量 ②補給必要量の算定 ③取水地点の決定 ④導水路の測量・検討 ⑤原水の水質試験 ⑥原水シルト分沈降速度の確認 ⑦沈砂池の検討	① 取水堰左岸護岸擁壁部の測量 ② 取水口背面石積み護岸の確認・測量 ③ 沈砂池排砂ゲートの確認 ④原水の水質試験 ⑤流入量観測
導水施設	取水地点検討に含まれる	①導水路、調整池、水圧管路部の測量 ② 側壁石積み流失部の確認 ③ 暗渠部の状況確認 ④ 山側排水側溝・フェンス位置の検討 ⑤ スクリーン位置の検討 ⑥ 堆砂量調査 ⑥ 交互排砂システムの検討（調整池） ⑦ 導水管（水圧管路部・圧力調整弁を含め）調査（管種、径、長さ等）
送水施設	取水地点検討に含まれる	—
浄水場	①水需要予測からの浄水場拡張の確認	①水需要予測からの浄水場拡張の確認
配水施設	①水需要予測より管網計算の実施 ②上記結果より、配水池規模及び位置の検討 ③スラッジ放流先の環境調査	①水需要予測より管網計算の実施 ②上記結果より、配水池規模及び位置の検討 ③スラッジ放流先の環境調査 ④排水処理施設用地の調査

表 8.3 各調査段階における実施内容

		担 当
国内事前準備	① 要請書及び予備調査収集資料の解析・検討 ② 水文資料の解析（計画取水量の検討） ③ 取水地点の予備検討（ローレンガウ） ④ 現地側作成技術報告書の検討（原単位、水需要予測等の検討） ⑤ 配水管網図計算の事前準備（節点図作成、標高入力、管路データ入力等） ⑥ 現地委託測量範囲の設定 ⑦ インセプション・レポートの作成 ⑧ 質問状の作成	給水①、給水②、 水文計画、
現地調査	① 基礎諸元の協議（目標年次、原単位、配水池容量、火災時検討等） ② 簡易人口調査の実施と現在人口の設定 ③ 測量委託と実施管理 ④ 水需要予測・補給必要量の算定（ローレンガウ） ⑤ 取水地点の決定（ローレンガウ） ⑥ 施設状況の確認・対策検討（ゴロカ） ⑦ 導水路の流入量観測（ゴロカ） ⑧ 原水の水質試験 ⑨ 原水シルト分沈降速度の確認（ローレンガウ） ⑩ 沈砂池の検討（ローレンガウ） ⑪ 導水路・調整池堆砂量調査（ゴロカ）	給水①、給水②、 水文計画、調達/ 積算、浄水場計画

	⑫ 調整池排砂システムの検討(ゴロカ) ⑬ 導水路調査(ゴロカ) ⑭ 配水管網計算 ⑮ 水道施設構造物の確認(弁室寸法、消火栓構造等) ⑯ 運営維持管理体制の確認 ⑰ 建設資・機材調査、単価調査 ⑱ 工事計画・環境関連資料の収集	
国内解析	① 取水施設の概略設計(取水堰改修計画、取水口、導水路計画等) ② 送水施設の概略設計(着水井寸法、ポンプ施設計画、ポンプ小屋寸法、送水管等) ③ 配水管網計算の実施と配水池設置計画(常時及び火災時検討) ④ 配水施設の概略設計(配水管計画図、付帯構造物、配水池等) ⑤ 浄水場施設の概略設計(凝集沈殿池、ろ過池等) ⑥ 上記水道施設概算事業費の積算 ⑦ 工事計画の検討 ⑧ ①～⑦を取りまとめた基本設計調査報告書の作成	給水①、給水②、 水文計画、調達/ 積算、浄水場計画
基本設計概要書の説明及び協議	① 基本設計調査報告書内容の協議	給水①、給水②、 水文計画

なお、本格調査における水質試験は次の項目が考えられる。

- ① 臭気
- ② 味
- ③ 色度
- ④ 濁度
- ⑤ pH
- ⑥ 電気伝導度
- ⑦ 総アルカリ度
- ⑧ 総硬度
- ⑨ 過マンガン酸カリウム消費量
- ⑩ アンモニア性窒素
- ⑪ 塩素付
- ⑫ 鉄
- ⑬ マンガン
- ⑭ 一般細菌
- ⑮ 大腸菌

8.4 調査スケジュール

上記の本格調査時の実施内容と確認事項を考慮すると、調査分野は給水計画、水文、浄水場、調達計画/積算から構成され、スケジュールは表 8.4 のとおりになるものと思われる。

表8.4 調査スケジュール

調査分野	月数								M/M		
	1	2	3	4	5	6	7	8	国内	現地	計
維持管理計画 (給水計画1)	■	■	■	■			■		1.50	2.50	4.00
給水計画2	■	■	■	■	■		■		3.00	2.50	5.50
水文計画	■	■	■	■			■		1.00	2.50	3.50
浄水場計画		■	■	■	■				1.00	1.50	2.50
調達計画/積算		■	■	■		■	■		1.50	2.00	3.50
全体計画		■	■	■	■	■	■		8.00	11.00	19.00

「資料」

1. 協議議事録

MINUTES OF DISCUSSIONS
PREPARATORY STUDY
ON
THE PROJECT FOR TOWN WATER SUPPLY
IN
PAPUA NEW GUINEA

In response to a request from the Government of Papua New Guinea (hereinafter referred to as "PNG"), the Government of Japan decided to conduct a Preparatory Study on the Project for Town Water Supply (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to PNG the Preparatory Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Kaoru Iwasaki, resident representative, JICA PNG Office, and is scheduled to stay in the country from January 31 to March 4.

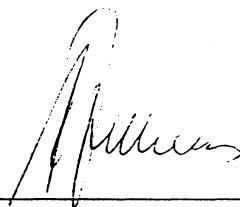
The Team held discussions with the officials concerned of the Government of PNG and conducted a field survey at the study areas.

As a result of discussions and field survey, both parties confirmed the main items described on the attached sheets. Subject to the decision by the Government of Japan, JICA will conduct a Basic Design Study on the Project.

Port Moresby, February 11, 2000




Mr. Kaoru Iwasaki
Leader
Preparatory Study Team
Japan International Cooperation Agency



Mr. Camillus Midire
Secretary
Department of National Planning & Monitoring



Mr. Patrick Amini OBE
Managing Director
PNG Waterboard



Mr. Yaunggao Uyassi
Town Manager
Goroka Urban Local Level Government

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the water supply services in Lorengau and Goroka town in order to make safe and stable water supply for the residents.

2. Project sites

The sites of the Project are Lorengau and Goroka town.

3. Responsible and Implementing Agency

3-1. The Responsible Agency

Department of National Planning & Monitoring

3-2. The Implementing Agency

(1) Lorengau

PNG Waterboard in cooperation with Manus Provincial Government

(2) Goroka

Goroka Urban Local Level Government

4. Items requested by the Government of PNG

After discussions with the Team, the items described in Annex-1 were finally requested by PNG side. JICA will assess the appropriateness of the request and will report the findings to the Government of Japan.

5. Japan's Grant Aid Scheme

5-1 PNG side understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-2.

5-2 PNG side will take the necessary measures, as described in Annex-3, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

If the Project is found feasible as a result of the Preparatory Study, JICA will send the Basic Design Study Team around July.

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Annex-1

1. Lorengau

- To upgrade the intake facilities
- To upgrade the pump house
 - shelter
 - pumps
 - switchboard
- To construct a new tank
- To upgrade pipelines
 - from intake facility to pump house
 - from pump house to storage tank
 - from storage tank to post office
 - ward 1, 2, 3, 4, 5, 6, 7 and Kolwin
- To install about 500 water meters
- To install Hydraulic rams at Tamat and Section 42

2. Goroka

- To rehabilitate the intake facilities
 - river bank protection of intake
 - open channel
 - diurnal pond
- To replace existing steel and asbestos pipes with dia. 200 mm from diurnal pond to overflow pipe
- To replace all asbestos pipes
 - from overflow pipe to the treatment plant
 - from water treatment plant to reservoirs
 - Goroka town reticulation system
- To install at least one water meter in each of the 10 villages
- To rehabilitate the 2 existing reservoirs at Mt. Kiss
 - repainting 2 reservoirs
 - replacement of the valves
- To construct a new reservoir at Mt. Kiss
- To rehabilitate existing water treatment plant
 - installation of meter
 - replacement of filter media
 - construction of a new chemical feeding facility
 - provision of water quality test kits to be used for raw water analysis
- To construct a new treatment plant next to the existing plant
- To construct a sludge treatment facility

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Annex-2 Japan's Grant Aid System

1. Grant Aid Procedures

1) Japan's Grant Aid Program is executed through the following procedures.

- Application (Request made by the recipient country)
- Study (Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet)
- Determination of Implementation (Exchange of Notes between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study) using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study Report prepared by JICA, and the results are then submitted to the Cabinet for an approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contract and so on.

2. Basic Design Study

1) Contents of the study

The aim of the Basic Design Study (hereafter referred to as "the Study") conducted by JICA on a requested project (hereafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

- a) Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
- b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
- c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
- d) Preparation of a basic design of the Project.
- e) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of the Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select

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(a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry (ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consultant firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) Period

"The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.

However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

4) Purchase of the Products and or Services

Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely, consulting, constructing and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality)

5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

6) Undertakings required of the Government of the Recipient Country

(As described in Annex-3)

7) Proper Use

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) Re-export

The products purchased under the Grant Aid should not be re-exported from the recipient country.

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9) Banking Arrangements(B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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Annex-3 Necessary Measures to be taken by the PNG Side

Following necessary measures should be taken by the PNG Side on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project
2. To prepare the land for the Project and secure the legal rights to build facilities.
3. To provide proper access road to the Project area, if necessary.
4. To remove existing facilities, if necessary.
5. To bear commissions to the Japanese bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
7. To provide warehouse for storage of spare parts and other equipment procured by the Project.
8. To undertake incidental outdoor works such as security of the sites, fencing, gates and exterior lighting around.
9. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in PNG with respect to the supply of the products and services under the verified contracts.
10. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into PNG and stay therein for the performance of their work in accordance with the relevant laws and regulations of PNG.
11. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
12. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Project.
13. To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.
14. To assign the necessary staff and secure the necessary budget for operation and maintenance of the equipment purchased under the Grant Aid.

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2. 調査団員構成

担 当	氏 名	所 属
総括（団長）	岩崎 薫	国際協力事業団パプア・ニューギニア事務所、所長
計画管理	小林 健一郎	国際協力事業団無償資金協力部、業務第一課
上水道計画	山川 精一	株式会社アイ・エヌ・エー管理本部国際室長
配管網計画	原田 容逸	株式会社協和コンサルタンツ、国際事業部

3. 調査日程

日順	月	日	曜日	行程	宿泊地	調査内容
1	11	30	日	成田-	機内	移動 (JL726)
2	1	31	月	- ケアンズ-Port Moresby	Port Moresby	JICA PNG Office 打合せ、日本大使館表敬
3	2	1	火		Port Moresby	PNG Waterboard表敬・打合せ
4	2	2	水	Port Moresby - Lorengau	Lorengau	移動 (PX226)、Manus Provincial Administration及びLorengau ULLG表敬・打合せ
5	2	3	木		Lorengau	Lorengau ULLG打合せ Manus Provincial Governor & Administrator表敬、現地踏査
6	2	4	金		Lorengau	Lorengau ULLG打合せ、現地踏査
7	2	5	土		Lorengau	Lorengau ULLG打合せ、現地踏査
8	2	6	日		Port Moresby	資料整理、移動 (PX225)
9	2	7	月	Port Moresby - Goroka	Goroka	移動 (PX160)、Goroka ULLG表敬・打合せ、現地踏査
10	2	8	火		Goroka	Goroka ULLG打合せ、現地踏査
11	2	9	水		Goroka	Goroka ULLG打合せ、現地踏査
12	2	10	木	Goroka - Port Moresby	Port Moresby	移動 (PX161)、JICA Office打合せ、現地踏査
13	2	11	金		Port Moresby	Dept. of National Planning & Monitoring表敬・ミニッツ署名
14	2	12	土		Port Moresby	JICA 小林職員帰国、資料整理
15	2	13	日		Port Moresby	資料整理
16	2	14	月		Port Moresby	大使館報告、Waterboard打合せ、JICA Office打合せ (現地調査費等)
17	2	15	火		Port Moresby	Waterboard打合せ、JICA Office打合せ、National Agriculture Research Institute
18	2	16	水		Port Moresby	Waterboard打合せ、JICA Office打合せ、市場調査 (パワメカ、ジョタカ等)、EU
19	2	17	木		Port Moresby	Waterboard打合せ、JICA Office打合せ、Environmental & Conservation Office、ADB
20	2	18	金		Port Moresby	NPO、EDA RANU、市場調査 (ジョタカ)
21	2	19	土		Port Moresby	資料整理
22	2	20	日		Port Moresby	資料整理
23	2	21	月		Port Moresby	EDA RANU (Mt. Eriama 浄水場、Romanポンプ場、Rouna取水地点、配水管ルート、3-Mile配水池等視察)
24	2	22	火		Port Moresby	AusAID、Environmental & Conservation Office、市場調査 (パワメカ、ジョタカ等)
25	2	23	水		Port Moresby	Waterboard Operation Division打合せ、JICA Office打合せ、National Weather Service
26	2	24	木		Port Moresby	Waterboard 打合せ、National Weather Service、市場調査 (リース会社等)
27	2	25	金		Port Moresby	Waterboard 打合せ、JICA Office打合せ、市場調査 (リース会社等)
28	2	26	土		Port Moresby	資料整理
29	2	27	日		Port Moresby	資料整理
30	2	28	月	Port Moresby - Madan	Madan	移動 (PX110)、Waterboard Madan支局打合せ、Panim新設取水・浄水システム調査
31	2	29	火	Madan - Port Moresby	Port Moresby	Gum既設上水道システム・Workshop 調査、移動 (PX193)
32	3	1	水		Port Moresby	National Weather Service、Environmental & Conservation Office、Waterboard Operation Division打合せ
33	3	2	木		Port Moresby	Environmental & Conservation Office、現地報告書作成
34	3	3	金		Port Moresby	JICA Office報告、Waterboard 打合せ・挨拶
35	3	4	土	Port Moresby - Singapore	機内	移動 (PX392)
36	3	5	日	Singapore - 成田		コンサル団員帰国 (JL710)

ULLG = Urban Local Level Government

4. 面会者リスト

1. Department of National Planning & Monitoring
 - Mr. Camillus Midire Secretary
 - Ms. Marianna Ellingson FAS, Foreign Aid Management Division
 - Mr. Noel Geti Senior Advisor- Japan ODA / JBIC Desk
 - Mr. John Kol Programme Officer (Japan Desk)

2. PNG Waterboard
 - Mr. Patrick K. Amini Managing Director
 - Mr. Amo Mark Engineering Manager
 - Mr. S.G.Nanayakkara Principal Engineer
 - Mr. Ukatha Utiwani Operation Manager
 - Mr. Benny B. Bobola Graduate Engineer
 - Mr. Sebastian Tomausi Graduate Engineer
 - Mr. Bruce Sevua Waterboard Madan Office / Production Supervisor

3. Manus Provincial Government
 - Hon. Steven Pokawin Governor
 - Mr. Simeon Malai Provincial Administrator
 - Mr. James Pokris Acting Assistant Administrator
 - Mr. Soni Pori Engineering Works Coordinator
 - Mr. John Ndrasal Water Forman
 - Mr. John Rokam Former Water Supervision
 - Mr. Otto Molean Project Planner Implementation

4. Loregau Urban Local Level Government
 - Mr. Wilson Kuve Manager
 - Mr. Watah Namun Engineering Works Coordinator,

5. Others (Lorengau)
 - Mr. Noah Posakei Land Owner

6. Goroka Urban Local Level Government
 - Mr. Michael Gotaha Mayor
 - Mr. Yaunggao Uyassi Town Manager
 - Mr. Hanold Aboni Deputy Town Manager
 - Mr. Robert Yamnaki Town Engineer
 - Mr. Nelson Sabumei Works Manager
 - Mr. Cliffson Isaiah Acting Financial Controller
 - Mr. Bill Kavanamur District Administrator

7. EDA RANU
 - Mr. Billy Imar General Manager
 - Mr. Ali Aihi Chief Engineer
 - Mr. Mannen Kuluwah Water Operation Manager
 - Mr. Geren Gairo Operation Supervisor

8. Department of Environment & Conservation / Water Resources Management Branch
 - Mr. Maino Virobo Acting Manager, Hydrological Services

9. Department of Environment & Conservation / Office of Environment & Conservation
 - Mr. Leo Mandeakali Senior EIA Officer
 - Mr. Paul Maliou Senior EIA Officer

10. National Weather Service
Mr. Samuel Maiha Climatorologist
11. National Capital District Commission (NCDC)
Dr. B.M. Karunaratne Engineering Design / Project Management Section
12. European Union / Delegation of the European Commission in Papua New Guinea
Mr. Richard Applebee First Counselor
13. Asian Development Bank (Special Mission in Papua New Guinea)
Mr. Helmut S. Marko Project Implementation Officer
14. Australian Agency for International Development (AusAID)
Mr. Sinna M Sinnappurajar First Secretary (Development Co-operation)
15. Consultants
Mr. Malcolm Ehrlich Water Supply Engineer / Provincial Towns Water Supply Project
(ADB)
Mr. Sevese Eafeare Project Engineer / JC-KRTA Consulting Group (EDA RANU)
16. Contractor and Supplier
Mr. David Lyall Regional Operations Manager / Downer Construction PNG Pty
Limited
Mr. T. George Constantinou Managing Director / HEBOU Construction (PNG) Ltd.
Mr. Jacob Ban Production Manager / Moresby Plumbing Supplies & Services Pty.
Ltd.
17. 在 PNG 日本大使館
田中辰夫 特命全權大使
岡田祐二 一等書記官
清水一郎 一等書記官
18. JICA PNG 事務所
岩崎 薫 所長
神内 圭 所員
稻生 俊貴 所員
星野 明彦 所員
Mr. Tony Ombo Programme Officer
亀井 みゆき 医療調整員

5. 収集資料

番号	分野	形状	名称	発行元
1	一般	地図	Papua New Guinea, General Reference Map, scale=1:2,500,00	National Mapping Bureau
2	"	"	Lorengau, sheet 8393, Papua New Guinea, scale=1:100,000	"
3	"	"	Malai, sheet 8293, Papua New Guinea, scale=1:100,000	"
4	"	"	Goroka, sheet 7985, Papua New Guinea, scale=1:100,000	"
5	"	"	Lorengau Township, scale=1:2,000, 10 sheets	"
6	"	"	Goroka Township, scale=1:2,000, 12 sheets	"
7	社会	書籍	The Eastern Highlands	Sarah Howroyd
8	"	冊子	Goroka and Eastern Highlands	Goroka Chamber of Commerce
9	統計	報告書	Abstract of Statistic, December Quarter 1998	National Statistical Office
10	"	"	Report on the 1990 National Population and Housing Census in Papua New Guinea	"
11	"	"	Final Figures Census Unit Populations, Manus Province, 1990 National Population Census	"
12	"	"	Final Figures Census Unit Populations, Eastern Highlands Province, 1990 National Population Census	"
13	"	"	Demographic and Health Survey 1996, National Report	"
14	"	"	Demographic and Health Survey 1996, Summary Report	"
15	"	"	Demographic and Health Survey 1996, Manus Province	"
16	"	"	Demographic and Health Survey 1996, Eastern Highlands Province	"
17	"	"	Consumer Price Index, September Quarter 1999	"
18	"	"	Papua New Guinea, Population Distribution by Province, 1990	"
19	"	"	Papua New Guinea, Physiological Density of Population, 1990	"
20	開発	"	Cooperation between the European Union and Papua New Guinea, Annual Report 1998	Delegation of the European Commission
21	"	"	Five Year Development Plan, 1991	Manus Province
22	"	"	Papua New Guinea Program Profiles, 1998	Australian Agency for International Development
23	"	"	Country Strategy Note 1997-2001	United Nations Development Programme
24	"	コピー	Country Assistance Plan Papua New Guinea (1999-2001)	Asian Development Bank

番号	分野	形状	名称	発行元
25	"	"	Medium Term Development Strategy 1997-2002 A Birige into the 21st Century	Ministry for National Planning
26	環境	コピー	Environmental Planning Act, 1982	Ministry of environment & Conservation
27	"	"	Envrionmental Planning Act, General Guidelines for the Preparation and Content of Environmental Plans	Department of Environment & Coservation
28	水資源	冊子	Water Resources Act, 1982	National Parliament
29	水道	冊子	PNG Water, News Magazine	The Waterboard
30	"	"	PNG Waterboard, Corporate Plan 1999-2003	"
31	"	報告書	Strategy for the Future, Strategic direction 2000	"
32	"	"	Feasibility Study, Lorengau Town Sewerage Scheme, February 1995	Willing & Partners, Consulting Engineers
33	"	"	Lorengau Town Water Supply Project Brief	Manus Province
34	"	"	Lorengau Water Supply Upgrading, Design Report (Draft Copy), September 1991	The Waterboard
35	"	マニュアル	Lorengau Water Treatment Plant, Operation & Maintenance Manual	Purac Pacific, an Anglian Water Group Company
36	"	"	Design Manual	The Waterboard
37	"	図面	Lorengau Water Supply, Plan & Longitudinal Section of Proposed Pipeline from Dam to Pumphouse	Department of Works
38	"	"	Lorengau Water Supply, Stage 1 Extension, River Intake and Pumphouse Arrangement	PWD
39	"	"	Lorengau Water Supply, Stage 1 Extension, General Arrangement	PWD
40	"	"	Lorengau Water Supply Master Plan, 3 sheets, scale = 1:2,500	PWD
41	"	報告書	Feasibility Study GOROKA Water Supply & Sewerage Upgrading Project	Eastern Highlands Capital Authority
42	"	"	Water and sewerage Upgrading Socio-economic Survey-March, 1998	Goroka Urban Local Level Government
43	"	"	Financial Statement For Year Ended 31st December 1996	Eastern Highlands Capital Authority
44	"	"	Financial Report 1997	Goroka Urban Local Level Government
45	"	"	Financial Report of Income & Expenditure 1998	Goroka Urban Local Level Government
46	"	"	Manpower Study & Establishment 1998	Goroka Urban Local Level Government
47	"	図面	Goroka Town Sewerage Plan, scale=1:4,000	Goroka Urban Local Level Government
48	"	"	Gorka Town Water Reticulation Plan, scale=1:4,000	"
49	"	"	"Goroka Water Supply Augmentation" Locality Plan	Department of Works & Supply
50	"	"	"Goroka Water Supply Augmentation" Soil Profile	"

番号	分野	形状	名称	発行元
51	"	"	"Goroka Water Supply Augmentation" Gravity main-Treatment Plant to Reservoir Plan, 2 sheets	"
52	"	"	"Goroka Water Supply Augmentation" Gravity main-Treatment Plant to Reservoir, Plan and Longitudinal Section	"
53	"	"	"Goroka Water Supply Augmentation" Gravity main-Treatment Plant to Reservoir, Longitudinal Section, 2 sheets	"
54	"	"	"Goroka Water Supply Augmentation" 300mm Inlet to Treatment Plant	"
55	"	"	"Goroka Water Supply Augmentation" Existing Treatment Layout & Sections	"
56	"	"	"Goroka Water Supply Augmentation" Treatment Plant, Existing Layout Plan	"
57	"	"	"Goroka Water Supply Augmentation" Thrust Block	"
58	"	"	"Goroka Water Supply Augmentation" Miscellaneous Details	"
59	"	"	"Goroka Water Supply " Proposed Reservoir Site	"
60	"	"	"Goroka Water Supply " Tank Site	"
61	"	"	"Goroka Water Supply" 4,550 ML Tank	Department of Works
62	"	"	"Goroka Water Supply" Proposed Tank No.3, Inlet and Outlet Mains- Plan, long, Section & Details	"
63	"	"	Goroka Hydro-electric Scheme, Layout Plan and Extensions	Commonwealth of Australia, Dept. of Works
64	"	"	"Goroka-Town Water Supply" As-constructed Mains Reticulation	"
65	"	"	"Administration-Goroka" Water Supply Reticulation Layout	"
66	"	"	Standard 500,000 Gallon Mild Steel Water Storage Reservoir	"
67	"	"	"Goroka Water Treatment Plant Augmentation" Plant Layout- Elevations	Water Treatment Australia Pty Ltd.
68	"	"	"Goroka Water Treatment Plant Augmentation" Washout, Filtered & Settled Water & Clarifier Inlet Piping	"
69	"	"	"Goroka Water Treatment Plant Augmentation" Details of Filter Floor- New Filters #3 & #4, 2 sheets	"
70	"	"	"Goroka Water Treatment Plant Augmentation" Clarifier Rework	"
71	"	"	"Goroka Water Treatment Plant Augmentation" Backwash, Piping & Filter Inlet Water Details	"
72	"	"	"Goroka Water Treatment Plant Augmentation" Plant Layout Plan	"
73	"	"	"Goroka Water Treatment Plant Augmentation" Filter Floor Installation Instructions, 2 sheets	"

番号	分野	形状	名称	発行元
74	"	"	"Goroka Water Treatment Plant Augmentation" Filter Inlet Weir Details	"
75	"	"	"Goroka Water Treatment Plant Augmentation" Filter Foundation Details, 2 sheets	"
76	"	"	"PWD-Goroka Water Supply" General Arrangement of Clarifier & Filter, 2 Sheets	"
77	"	"	"Goroka Water Supply" Modifications to Sedimentation Tank	PWD, Territory of Papua New Guinea
78	"	"	"Goroka Water Supply" Treatment Plant Site Plan	"
79	"	"	Standard Water Mains Details	"
80	"	"	"Goroka Water Supply" Duplication of 8" Main Intake Structure to Treatment Plant to Storages	PWD, Papua & New Guinea
81	"	"	"Goroka Water Supply" Treatment Plant Layout, Existing Details prior to Duplication	"
82	"	"	Eada Ranu, Annual Report, 1998	Eada Ranu
83	"	"	Provincial Water Supply & Sanitation Project PPTA(TA3173 PNG), Inception Report, PNG waterboard/The Asian Development Bank	Fraser Thomas Partners/Gutteridge Haskins and Davey Plc
84	"	電算出力	Lae District Income & Expenditure Account 1999	The Waterboard
85	"	"	Madan District Income & Expenditure Account 1999	"
86	都市計画	図面	Town of Goroka	Goroka Urban Local Level Government
87	建設	パンフレット	On-Site_Donwer Construction	Donwer Construction PNG Pty Ltd.
88	"	"	Hebou Constructions (PNG) Pty Ltd.	Constantinou Group
89	"	コピー	Price List for UPVC pipes & Fittings	Pipemakers, PNG
90	"	"	Hire Rate (1998-1999)	Bishop Brothers Engineering Equipment Hire
91	統計	コピー	Population projection by health centre-1991~2000	Manus Province
92	"	"	Lorengau General Hospital Outpatients -1997~2000	"
93	水道	"	ローレンガウ上水道システムに係る経費 (1997)	"
94	"	"	ローレンガウ上水道システムに係る経費 (1998)	"
95	"	"	ローレンガウ上水道システムに係る経費 (1999)	"
96	"	"	ローレンガウ上水道システムに係る予算及び実績	"
97	"	"	ローレンガウ上水道システムに係る検討書	PWD/Waterboard
98	一般	"	Manus Province の組織・機構図	Manus Province
99	"	"	Eastern Highlands Province の組織・機構図	Eastern Highlands Province
100	水道	"	浄水場予定地測量図	Goroka Urban Local Level Government

番号	分野	形状	名称	発行元
101	"	報告書	Draft final report Vol. 4 Environmental Impact Assessment	Asian Development Bank
102	"	"	Provincial Water Supply & Sanitation Project PPTA(TA3173 PNG), Interim Report, Part B	PNG waterboard/The Asian Development Bank