

## 添付資料



## 資料-1 調査団員・氏名



資料-1 調査団員氏名、所属

第1回現地調査

(JICA)

氏名	担当	派遣期間	所属
横田 義昭	総括／上水計画	2019年10月31日 ～11月9日	独立行政法人国際協力機構 (JICA)
濱野 聡	協力企画1	2019年10月31日 ～11月9日	独立行政法人国際協力機構 (JICA)
松林 美葉	協力企画2	2019年10月31日 ～11月9日	独立行政法人国際協力機構 (JICA)

(コンサルタント)

氏名	担当	派遣期間	所属
藤井 克巳	業務主任／給水計画1 ／運営・維持管理計画1	2019年11月1日 ～11月30日	八千代エンジニアリング 株式会社
大森 光仁	送配水計画1／施設設計1 ／給水計画2 ／運営・維持管理計画2	2019年11月1日 ～11月30日	八千代エンジニアリング 株式会社
瀬野 正敏	送配水計画2／施設設計2	2019年11月11日 ～11月30日	八千代エンジニアリング 株式会社
飯島 伸幸	地下水開発計画／水理地 質／物理探査	2019年11月1日 ～11月20日	八千代エンジニアリング 株式会社
河上 惇一	浄水施設計画・設計	2019年11月11日 ～11月30日	株式会社 TEC インターナショナル
石浦 和広	環境社会配慮／社会条件 調査	2019年11月8日 ～11月22日	八千代エンジニアリング 株式会社
岸川 公紀	施工・調達計画／積算／ 業務調整1	2019年11月1日 ～11月30日	八千代エンジニアリング 株式会社

第2回現地調査  
(JICA)

氏名	担当	派遣期間	所属
横田 義昭	総括／上水計画	2020年1月28日 ～2月6日	独立行政法人国際協力機構 (JICA)
久保田 広志	総括／上水計画	2020年1月28日 ～2月6日	独立行政法人国際協力機構 (JICA)
濱野 聡	協力企画1	2020年1月30日 ～2月3日	独立行政法人国際協力機構 (JICA)
松林 美葉	協力企画2	2020年1月28日 ～2月6日	独立行政法人国際協力機構 (JICA)

(コンサルタント)

氏名	担当	派遣期間	所属
藤井 克巳	業務主任／給水計画1 ／運営・維持管理計画1	2020年1月27日 ～2月13日 ／2020年2月24日 ～3月6日	八千代エンジニアリング 株式会社
大森 光仁	送配水計画1／施設設計1 ／給水計画2 ／運営・維持管理計画2	2020年1月27日 ～3月6日	八千代エンジニアリング 株式会社
瀬野 正敏	送配水計画2／施設設計2	2020年1月27日 ～2月25日	八千代エンジニアリング 株式会社
飯島 伸幸	地下水開発計画／水理地 質／物理探査	2020年1月21日 ～2月3日 ／2020年2月29日 ～3月24日	八千代エンジニアリング 株式会社
河上 惇一	浄水施設計画・設計	2020年2月5日 ～3月15日	株式会社 TEC インターナショナル
大坂 進一	機械／浄水施設計画・設 計1	2020年2月5日 ～2月24日	株式会社 TEC インターナショナル
石浦 和広	環境社会配慮／社会条件 調査	2020年2月22日 ～3月12日	八千代エンジニアリング 株式会社
原口 彩	建築	2020年2月5日 ～2月24日	八千代エンジニアリング 株式会社
岸川 公紀	施工・調達計画／積算／ 業務調整1	2020年2月4日 ～3月24日	八千代エンジニアリング 株式会社

氏名	担当	派遣期間	所属
岩本 信一郎	機械／電気設備計画・設計 2／業務調整 2	2020年1月21日 ～2月29日	八千代エンジニアリング株式会社
ビバス・グラガイ	浄水施設計画・設計 2／業務調整 3	2020年2月5日 ～3月5日	株式会社 TEC インターナショナル

## 概略設計概要説明

(JICA)

氏名	担当	派遣期間	所属
井上 陽一	総括	2021年8月31日、9月2日 - 3日、6日	独立行政法人国際協力機構 (JICA)
久保田 広志	給水計画	2021年8月31日、9月2日 - 3日、6日	独立行政法人国際協力機構 (JICA)
松林 美葉	協力企画	2021年8月31日、9月2日 - 3日、6日	独立行政法人国際協力機構 (JICA)

(コンサルタント)

氏名	担当	派遣期間	所属
藤井 克己	業務主任／給水計画1／運営・維持管理計画 1	2021年8月31日、9月2日 - 3日	八千代エンジニアリング株式会社
大森 光仁	送配水計画 1／施設設計 1／給水計画 2／運営・維持管理計画 2	2021年8月31日、9月2日 - 3日	八千代エンジニアリング株式会社
岸川 公紀	施工・調達計画／積算／業務調整 1	2021年8月31日、9月2日 - 3日	八千代エンジニアリング株式会社





## 資料-2 調査行程



## 資料-2 調査日程

### 第1回現地調査

No	年月日		活動	
1	2019.11.1	金	官団員（横田、濱野、松林）東京発（2019.10.31）・カトマンズ着 コンサルタント団員（藤井、大森、飯島、岸川）東京発・カトマンズ着 MoWS、NWSC へのインセプションレポート説明	
2	2019.11.2	土	ビラトナガルへ移動（全団員）	
3	2019.11.3	日	NWSC ビラトナガル支所及びビラトナガル市へのインセプションレポート説明 及び意向確認、現場視察	
4	2019.11.4	月	NWSC ビラトナガル市と協議、現場視察	
5	2019.11.5	火	官団員及びコンサルタント団員（藤井、大森）カトマンズへ移動、再委託先選定作業	井戸ポンプ場調査、現地井戸掘削会社からの情報収集
6	2019.11.6	水	NWSC との MD 協議、再委託先選定作業	井戸ポンプ場調査、垂直電気探査調査 地点選定調査
7	2019.11.7	木	再委託先選定作業、在ネパール大使館報告	井戸ポンプ場調査、垂直電気探査調査 地点選定調査
8	2019.11.8	金	JICA 事務所報告、再委託先選定作業 官団員カトマンズ発 コンサルタント団員（石浦）東京発・カトマンズ着	井戸ポンプ場調査、垂直電気探査調査 地点選定調査
9	2019.11.9	土	コンサルタント団員（藤井、大森、石浦） ビラトナガルへ移動 官団員東京着	資料整理
10	2019.11.10	日	既存システム現場踏査、再委託先選定作業	
11	2019.11.11	月	既存システム現場踏査、水質調査、再委託先選定作業	コンサルタント団員（瀬野、河上）東京発・カトマンズ着
12	2019.11.12	火	ステークホルダー会議、ビラトナガル市資料収集、既存システム現場踏査、水質調査、再委託先選定作業	コンサルタント団員（瀬野、河上）ビラトナガルへ移動
13	2019.11.13	水	既存システム現場踏査、水質調査、再委託先選定作業	
14	2019.11.14	木	既存システム現場踏査、水質調査、再委託先選定作業、水因性疾病調査、電力事情調査	
15	2019.11.15	金	既存システム現場踏査、水質調査、再委託先選定作業	
16	2019.11.16	土	既存システム調査	
17	2019.11.17	日	既存システム調査、水質調査、垂直電気探査、社会条件調査、水因性疾病調査	

No	年月日		活動	
18	2019.11.18	月	既存システム調査、水質調査、垂直電気探査、社会条件調査、洪水状況調査	コンサルタント団員（飯島）カトマンズへ移動
19	2019.11.19	火	既存システム調査、水質調査、垂直電気探査、社会条件調査	コンサルタント団員（飯島）カトマンズ発
20	2019.11.20	水	既存システム調査、水質調査、垂直電気探査、社会条件調査	コンサルタント団員（飯島）東京着 コンサルタント団員（藤井、石浦）カトマンズへ移動
21	2019.11.21	木	既存システム調査、水質調査、社会条件調査、気象データ調査	水質調査（再委託先実施状況確認） コンサルタント団員（石浦）カトマンズ発
22	2019.11.22	金	既存システム調査、社会条件調査、道路整備網調査、ピラトナガル市インフラ整備基準調査	水質調査（再委託先実施状況確認） コンサルタント団員（石浦）東京着
23	2019.11.23	土	資料整理	資料整理
24	2019.11.24	日	既存システム調査、社会条件調査、地下水情報調査、既存用排水路調査	地下水情報調査 建設市場調査
25	2019.11.25	月	社会条件調査 コンサルタント団員（大森、瀬野、河上、岸川）カトマンズへ移動	地下水情報調査 調査結果整理
26	2019.11.26	火	調査結果整理、地震関連情報収集、GIS データ収集	
27	2019.11.27	水	JICA 専門家協議、NWSC 本部でのラップアップ会議及び調査結果整理 建設市場調査	
28	2019.11.28	木	JICA 事務所報告	
29	2019.11.29	金	コンサルタント団員（藤井、大森、瀬野、河上、岸川）カトマンズ発	
30	2019.11.30	土	コンサルタント団員（藤井、大森、瀬野、河上、岸川）東京着	

## 第2回現地調査

No	年月日		活動	
1	2020.1.21	火	コンサルタント団員（飯島、岩本）東京発・カトマンズ着	再委託選定作業
2	2020.1.22	水	再委託選定作業	
3	2020.1.23	木	ピラトナガルへ移動（飯島、岩本）	
4	2020.1.24	金	NWSC と協議、再委託選定作業	
5	2020.1.25	土	資料整理	
6	2020.1.26	日	NWSC と協議、再委託先選定作業	
7	2020.1.27	月	NWSC と協議、再委託先選定作業	官団員（横田、久保田、松林）及びコンサルタント団員（藤井、大森、瀬野）東京発・カトマンズ到着

No	年月日		活動	
8	2020.1.28	火	NWSC と協議、再委託先 選定作業	給水省・NWSC へ第1次調査結果及び第2次調査内 容の説明
9	2020.1.29	水	NWSC と協議、再委託先 選定作業	官団員（横田、久保田、松林）及びコンサルタント団 員（藤井、大森、瀬野）ピラトナガルへ移動、NWSC・ ピラトナガル市へ第1次調査結果及び第2次調査内 容の説明 管団員（濱野）ビエンチャン発・カトマンズ着・ピラ トナガルへ移動
10	2020.1.30	木	NWSC との協議、既存システム現場踏査	
11	2020.1.31	金	ピラトナガル市との協議、既存システム現場踏査	
12	2020.2.1	土	資料整理	官団員（横田、久保田、濱野、松林）及びコンサルタ ント団員（藤井、大森、飯島）カトマンズへ移動
13	2020.2.2	日	既存システム調査、再委 託先選定作業、ADB プロ ジェクトとの協議	財務省と協議、給水省・NWSC へピラトナガル市と の協議結果報告 官団員（濱野）及びコンサルタント団員（飯島）カト マンズ発
14	2020.2.3	月	既存システム調査、再委 託先選定作業	NWSC との協議、建設市場調査 官団員（濱野）ビエンチャン着 コンサルタント団員（飯島）東京着
15	2020.2.4	火	既存システム調査、再委 託先選定作業、人口デー タ収集調査、ネパール電 力公社ピラトナガル支所 との協議	ADB 事務所と意見交換、給水省・NWSC との MD 協 議、JICA ネパール事務所報告、在ネパール大使館報 告（官団員のみ）
16	2020.2.5	水	既存システム調査、再委 託先選定作業	建設市場調査 官団員（横田、久保田、松林）カトマンズ発 コンサルタント団員（河上、大坂、原口、岸川）東京 発・カトマンズ到着、同団員（岩本）カトマンズへ移 動、同団員（ビバス）カトマンズ合流
17	2020.2.6	木	既存システム調査、再委 託先選定作業	建設市場調査 NWSC との協議 官団員（横田、久保田、松林）東京着 コンサルタント団員（大森、原口）ピラトナガルへ移 動
18	2020.2.7	金	既存システム調査、再委 託先選定作業、既存井戸 流量測定	建設市場調査 コンサルタント団員（藤井）ピラトナガルへ移動
19	2020.2.8	土	資料整理	資料整理

No	年月日		活動	
20	2020.2.9	日	既存システム調査、再委託先選定作業、既存井戸流量測定、試掘調査地点調査	建設市場調査
21	2020.2.10	月	既存システム調査、再委託先選定作業、ネパール電力公社ビラトナガル支所との協議、Nepal Telecom ビラトナガル支所との協議	建設市場調査 NWSC との協議 水質分析業者と協議
22	2020.2.11	火	既存システム調査、再委託先選定作業	建設市場調査
23	2020.2.12	水	既存システム調査、再委託先選定作業	NWSC との協議 コンサルタント団員（岩本）ビラトナガルへ移動
24	2020.2.13	木	既存システム調査、再委託先選定作業、下水処理場調査、ダンプサイト調査、ビラトナガル市建築課との協議	建設市場調査
25	2020.2.14	金	既存システム調査、再委託先選定作業	コンサルタント団員（河上、大坂、岸川、ビバス）ビラトナガルへ移動 コンサルタント団員（藤井）別業務へ従事のため一時アサイン中断（2/14-2/23）
26	2020.2.15	土	既存システム調査、資料整理、	
27	2020.2.16	日	既存システム調査、再委託先選定作業	
28	2020.2.17	月	既存システム調査、既存井戸流量測定、ラジビラー市既存浄水場（鉄・マンガン除去）調査	
29	2020.2.18	火	既存システム調査、Highway Project Office との協議	
30	2020.2.19	水	既存システム調査、ビラトナガル市道路課との協議	
31	2020.2.20	木	既存システム調査	
32	2020.2.21	金	既存システム調査、資料整理	
33	2020.2.22	土	資料整理	コンサルタント団員（瀬野、大坂、原口）カトマンズへ移動 コンサルタント団員（石浦）東京発・カトマンズ着

No	年月日		活動	
34	2020.2.23	日	既存システム調査、再委託先選定作業	再委託先選定作業（入札会） コンサルタント団員（大坂、原口）カトマンズ発 コンサルタント団員（藤井、瀬野、石浦）ピラトナガルへ移動
35	2020.2.24	月	既存システム調査、ネパール電力公社ピラトナガル支所との協議	コンサルタント団員（大坂、原口）東京着、コンサルタント団員（瀬野）カトマンズ発
36	2020.2.25	火	既存システム調査 WARD事務所との協議	コンサルタント団員（瀬野）東京着
37	2020.2.26	水	既存システム調査、井戸掘削事前準備	コンサルタント団員（岩本）カトマンズへ移動 建設市場調査
38	2020.2.27	木	既存システム調査、再委託先（土質・試掘）契約、土質調査事前準備	建設市場調査、資料整理
39	2020.2.28	金	ステークホルダー会議、再委託先（測量）契約、土質・試掘・測量調査事前準備	コンサルタント団員（岩本）カトマンズ発
40	2020.2.29	土	資料整理	コンサルタント団員（岩本）東京着 コンサルタント団員（飯島）東京発・カトマンズ着
41	2020.3.1	日	試掘井戸施工監理	コンサルタント団員（飯島）ピラトナガルへ移動
42	2020.3.2	月	試掘井戸施工監理	
43	2020.3.3	火	試掘井戸施工監理	コンサルタント団員（藤井、大森、河上、ビバス）カトマンズへ移動
44	2020.3.4	水	試掘井戸施工監理	NWSC との協議、JICA 報告、コンサルタント団員（河上）ピラトナガルへ移動
45	2020.3.5	木	試掘井戸施工監理	コンサルタント団員（藤井、大森）カトマンズ発
46	2020.3.6	金	試掘井戸施工監理	コンサルタント団員（藤井、大森）東京着
47	2020.3.7	土	収集データ及び状況整理	
48	2020.3.8	日	土質業者及び測量業者と調整	
49	2020.3.9	月	試掘井戸施工監理	コンサルタント団員（石浦、岸川）カトマンズへ移動
50	2020.3.10	火	試掘井戸施工監理（ピラトナガル）	環境省との協議（カトマンズ）
51	2020.3.11	水	試掘井戸施工監理	コンサルタント団員（石浦）カトマンズ発
52	2020.3.12	木	試掘井戸施工監理	コンサルタント団員（河上）カトマンズへ移動 コンサルタント団員（石浦）東京着
53	2020.3.13	金	試掘井戸施工監理	メーカー市場調査

No	年月日		活動	
54	2020.3.14	土	試掘井戸施工監理	コンサルタント団員（河上）カトマンズへ発 コンサルタント団員（岸川）ピラトナガルへ移動
55	2020.3.15	日	試掘井戸施工監理	コンサルタント団員（河上）東京着
56	2020.3.16	月	井戸施工監理及び土質業者と調整	
57	2020.3.17	火	井戸施工監理及び土質業者と調整	
58	2020.3.18	水	井戸施工監理及び土質業者と調整	
59	2020.3.19	木	井戸施工監理及び土質業者と調整	
60	2020.3.20	金	井戸施工監理及び調達計画にかかる市場の調査	
61	2020.3.21	土	試掘井戸施工監理	コンサルタント団員（飯島、岸川）カトマンズへ移動
62	2020.3.22	日	収集データ及び状況整理	
63	2020.3.23	月	カトマンズ発	コンサルタント団員（飯島、岸川）カトマンズ発
64	2020.3.24	火	東京着	コンサルタント団員（飯島、岸川）東京着

#### 概略設計概要説明

No.	日程	予定	日本側参加者	側参加者
1	8月31日（火）	プロジェクトの説明	コンサルタント	NWSC、ピラトナガル市
2	9月2日（木）	プロジェクト説明、MDの内容説明	JICA、コンサルタント	給水省、NWSC
3	9月3日（金）	MDの内容確認、協議、合意	JICA、コンサルタント	給水省、NWSC



### 資料-3 関係者（面会者）リスト



資料-3 関係者（面会者）リスト

所属及び氏名	職位
給水省 Ministry of Water Supply (MoWS)	
Mr. Madhav Belbase	Secretary
Er. Ramakanta Duwadi	Joint Secretary
Dr. Rajit Ojha	Senior Divisional Engineer, Water Supply Division
Mr. Sunil Kumar	Director General of DWSSM
Mr. Anil Bhadra	Deputy Director General of DWSSM
財務省 Ministry of Finance	
Mr. Khim Bahadur Kunwar	Under Secretary
ネパール水道公社 Nepal Water Supply Cooperation (NWSC)	
Dr. Bhupendra Prasad	General Manager
Mr. Ishwar Prasad	Deputy Manager
ネパール水道公社 ビラトナガル支所 NWSC Biratnagar Branch	
Mr. Er Sailendra Kumar Shah	Branch Manager
Mr. Birendra Yadav	Distribution Chief
Mr. Keshav Bahadur Rayamajhi	Production Chief
Mr. Ashish Nikhil Shah	Sub Engineer
Mr. Pahalman Bhatrai	Accounting Chief
道路局 Department of Roads (DOR), Ministry of Physical Infrastructure and Transport	
Mr. Badri Prasad Sharma	Project Director of Rani-Biratnagar-Itahari-Dharan Road Project
ビラトナガル市 Biratnagar Metropolitan Municipality	
Mr. Bhim Parajuli	Mayor
Mr. Sabin Dahal	Mayor Secretary
Mr. Ekadev Adhikari	Chief Administration Officer
Mr. Ratnakar Jha	Liaison Officer
Mr. Arjun Thapaliya	Building Division Chief Biratnagar
Mr. Gopal Pokharel	Chief of Urban Development Division
Mr. Er Ghanshyam Kafley	RUDP (Regional Urban Development Project)

	Project Engineer
Mr. Bharat Kumar Neupane	RUDP/STIUEIP (Secondary Town Integrated Urban Environmental Improvement Project), PIU (Project Implementation Unit) Project Manager
Mr. Punam Dohal	Chief of Social Development
Mr. Ramanand Yadav	Health Department (Acting Chief)
Mr. Utsav Pokharel	Health Department (Public health inspector)
Mr. Rajendra Pradhan	Chief of Financial Department (Leader of disaster management)
Ms. Anita Neupane	Environmental Section Chief
ワード・オフィス	
Mr. Devendra Raj Pokharel	Ward No. 4 Chairman
Mr. Min Kumar Acharya	Ward No. 5 Chairman
エネルギー・水資源・灌漑省 Ministry of Energy, Water Resources and Irrigation	
Mr. Dipendra Laudarj	Senior Divisional Hydrogeologist, Department of Water Resources and Irrigation
Mr. Sayan Shrestha	Division Chief, Water Supply & Sanitation Division Office for Division 4, Province 1
Mr. Rajiv Kumar Jha	Meteorologist, Water and Weather Office in Dharn, Hydrology and Meteorology Department for Province 1 & 2,
Mr. Surendra Shah	Senior Divisional Hydrogeologist in Biratnagar, Groundwater Resources and Irrigation Development Division
森林・環境省 Ministry of Forest and Environment	
Ms. Jwala Shrestha	Under Secretary & Chief, Environmental Impact Study Section
Mr. Suvash Sharma	Forest Officer
Mr. Amar Oli	Socialist
Mr. Tulsi Narayan Maharjan	Environment Standard and Monitoring Section
Morang 郡公衆保健事務所 Morang District Public Health Office	
Mr. Ramnandan Yadav	Immunization Officer
Mr. Utsav Pokhrel	Public Health Inspector
ネパール電力公社 Nepal Electricity Authority, Biratnagar Branch	
Mr. Er Rajiv Kumar Singh	Biratnagar Distribution Center Chief

Mr. Er Rajesh Krijhs	Biratnagar Distribution Center Electric engineer
ネパールテレコム Nepal Telecom	
Mr. Bimlesh Jha	Biratnagar Branch Manager
水利用衛生委員会 WUSC (Water Users and Sanitation Committee)	
Mr. Ram Babu Ghimire	Mangard WUSC
Mr. Somraj Adhikari	Jamungachhi WUSC
Mr. Bholā Baral	Pichara WUSC
Mr. Birendra Yadav	Jatauwa WUSC
アジア開発銀行 Asian Development Bank	
Mr. Saugata Dasgupta	Project Management Specialist
Mr. Shahidul Alam	Senior Project Officer
在ネパール日本国大使館	
三道義己	二等書記官
JICA ネパール事務所	
朝熊由美子	所長
永見光三	次長
江原由樹	次長
鳥海陽史	所員
Ms. Bidhya Pokhrel	Senior Program Officer



## **資料-4 協議議事録(M/D)**

(資料-4-1 第1回現地調査時)

(資料-4-2 第2回現地調査時)

(資料-4-3 概略設計概要説明)





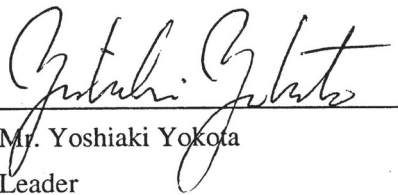
**資料-4-1 第 1 回現地調査協議議事録 (M/D)**



**Minutes of Discussions**  
**on the Preparatory Survey for the Project for**  
**Improvement of Water Supply System in Biratnagar**

Based on the several preliminary discussions between the Government of Federal Democratic Republic of Nepal (hereinafter referred to as “Nepal”) and Japan International Cooperation Agency (hereinafter referred to as “JICA”), JICA dispatched the Preparatory Survey Team for the Outline Design (hereinafter referred to as “the Team”) of the Project for Improvement of Water Supply System in Biratnagar (hereinafter referred to as “the Project”) to Nepal. The Team held a series of discussions with the officials of the Government of Nepal and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Kathmandu, 8<sup>th</sup> November, 2019



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Mr. Yoshiaki Yokota  
Leader

Preparatory Survey Team

Japan International Cooperation Agency (JICA)

Japan



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Er. Ramakanta Duwadi

Joint Secretary

Ministry of Water Supply (MoWS)

Nepal



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Dr. Bhupendra Prasad

General Manager

Nepal Water Supply Corporation (NWSC)

Nepal

## ATTACHMENT

### 1. Objective of the Project

The objective of the Project is to contribute the safe and stable water supply in Biratnagar City through rehabilitation and expansion of water supply system.

### 2. Title of the Preparatory Survey

Both sides confirmed the title of the Preparatory Survey as “The Preparatory Survey for the Project for Improvement of Water Supply System in Biratnagar”.

### 3. Project site

Both sides confirmed that the site of the Project is in Biratnagar City, which is shown in **Annex 1**. Nevertheless, the Project area will be delimited after due consultation with all the stakeholders concerned at the earliest possible time.

### 4. Responsible authority for the Project

Both sides confirmed the authorities responsible for the Project are as follows:

4-1. Ministry of Water Supply (MoWS) will be the executing agency for the Project (hereinafter referred to as “the Executing Agency”). The Executing Agency shall coordinate with all the relevant authorities including Biratnagar Metropolitan City Government (BMC) to ensure smooth implementation of the Project and ensure that the undertakings for the Project shall be managed by relevant authorities properly and on time.

4-2. Nepal Water Supply Corporation (NWSC) will be the implementing agency for the Project. Implementing agency shall assist the Executing Agency to implement the Project smoothly, and shall operate and maintain the Project facilities after the construction.

4-3. The organization charts of MoWS and NWSC are shown in **Annex 2**.

4-4. The Executing Agency, however, will further consult with other important stakeholders such as BMC and Department of Water Supply & Sewerage Management and come up with best workable implementation arrangement in the changed federal context.

### 5. Items requested by the Government of Nepal

5-1. As a result of discussions, both sides confirmed that the original requests for Japan's Grant Aid Scheme from Nepal side were as follows:

(1) Facilities

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- Deep wells
  - Filtration Units
  - Overhead Tanks
  - Distribution pipes
- (2) Equipment
- Intake pumps
  - Generators
  - Water meters
- (3) Soft (Non-physical) components
- O&M of constructed facilities
- (4) Design/Supervision

5-2. The both sides agreed that the actual project scope will be determined based on the preparatory survey result.

5-3. JICA will assess the feasibility of the above requested items through the survey and will report the findings to the Government of Japan. The final scope of the Project will be decided by the Government of Japan.

5-4. The Government of Nepal shall submit an official request to the Government of Japan through a diplomatic channel as soon as possible.

## 6. Procedures and Basic Principles of Japanese Grant

6-1. The Nepal side agreed that the procedures and basic principles of Japanese Grant (hereinafter referred to as "the Grant") as described in **Annex 3** shall be applied to the Project.

As for the monitoring of the implementation of the Project, JICA requires the Nepal side to submit the Project Monitoring Report of which form is attached as **Annex 4**.

6-2. The Nepal side agreed to take the necessary measures, as described in **Annex 5**, for smooth implementation of the Project. The contents and organization in charge for each item of the **Annex 5** will be confirmed, elaborated and refined during the Preparatory Survey and be agreed in the mission dispatched for explanation of the Draft Preparatory Survey Report.

The contents of **Annex 5** will be updated as the Preparatory Survey progresses, and eventually, will be used as an attachment to the Grant Agreement.

## 7. Schedule of the Survey

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- 7-1. The consultant team will conduct the first field survey in Nepal until the end of November, 2019.
- 7-2. JICA and the consultant team will implement the second field survey in Nepal from the middle of January to the end of February, 2020.
- 7-3. The official request to the Government of Japan will be submitted as soon as possible.
- 7-4. JICA will prepare a draft Preparatory Survey Report in English and dispatch a mission to Nepal in order to explain its contents in August, 2020.
- 7-5. If the contents of the draft Preparatory Survey Report are accepted and the undertakings for the Project are fully agreed by the Nepal side, JICA will finalize the Preparatory Survey Report and send it to Nepal around December, 2020.
- 7-6. The above schedule is tentative and subject to change.

#### 8. Environmental and Social Considerations

- 8-1. The Nepal side confirmed to give due environmental and social considerations during implementation, and after completion of the Project, in accordance with the JICA Guidelines for Environmental and Social Considerations (April, 2010).

- 8-2. The Project is categorized as "B" from the following considerations:

The Project is not located in a sensitive area, nor has sensitive characteristics, nor falls into sensitive sectors under the JICA guidelines for environmental and social consideration (April, 2010), and its potential adverse impacts on the environment are not likely to be significant.

The Nepal side confirmed to conduct the necessary procedures concerning the environmental assessment (including stakeholder meetings, Environmental Impact Assessment (EIA) /Initial Environmental Examination (IEE) and information disclosure, etc.) and make EIA/IEE report of the Project. The EIA/IEE approval shall be received from the responsible authorities and submitted to JICA within 1 month after the signing of the G/A.

- 8-3. For the Project that will result in involuntary resettlement, the Nepal side confirmed to prepare a Resettlement Action Plan (RAP)/Abbreviated Resettlement Action Plan (ARAP) and make it available to the public. In addition, the Nepal side confirmed to provide the affected people with sufficient compensation and/or support in accordance with RAP/ARAP, which is based on JICA Guidelines for Environmental and Social Considerations (April, 2010), in a timely manner.

#### 9. Other Relevant Issues

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#### 9-1. Request by BMC

BMC requested the Team to consider the followings:

- (1) "One house one connection" with 24-hour safe water supply
- (2) 100% coverage in the entire city with rehabilitation of the existing pipes
- (3) Single governing modality of water supply system by BMC

The Team took note the requests and the Nepal side confirmed that BMC agreed to provide results of discussions with stakeholders and official procedure plan on item (3) by the end of January, 2020.

#### 9-2. Land acquisition

The construction site will be determined based on the first field survey results and tentative scoping of the Project. In case any arrangements among other related parties are required, the Nepal side will take the necessary measures.

The Team explained that the entire land acquisition process should be completed by the distribution of tender documents at the latest. Unless the land acquisition process proceeds according to the explained schedule, the start of the Project will be delayed. The Nepal side agreed to the explained schedule.

#### 9-3. The Target Year of the Project

Both sides agreed that the target year of the Project is 2026, which is considered to be around three or four years after the completion of the Project and outline design of the Project shall be conducted based on the demand and situation at the target year. However, based on the request of the Nepal side, the Survey will also include a preliminary estimation of the water demand and required facilities for 15 years, in order to facilitate further development plan of water facilities to be conducted by the Nepal Side.

#### 9-4. Budget Preparation

NWSC agreed to secure the necessary budget for the Project and for operation/maintenance of the determined facilities. Detailed information about the necessary amount of budget will be informed by August, 2020 during the explanation of outline design.

#### 9-5. Tax

The Nepal side confirmed the required procedures for the application of tax exemption. The Nepal side also confirmed that it performs the key active



administrative role, and takes necessary measures without delay.

9-6. Necessary Cooperation for the Survey by the Nepal side

The Nepal side agreed to facilitate the Survey by following activities:

- 1) Data and information related to the Survey
- 2) Granting permits necessary for the Team to conduct the Survey
- 3) Counterpart personnel to the Team
- 4) Coordination of relevant agencies
- 5) Credentials or identification cards
- 6) Arrangement of its own transportation for its staff to the site and other organizations concerned with the Survey
- 7) Security-related information as well as measures to ensure the safety of the Team
- 8) Information as well as support for obtaining medical service
- 9) Suitable office space with office furniture
- 10) Support in obtaining other privileges and benefits, if necessary
- 11) Other necessary facilitation for the Team

Annex 1 Project Site

Annex 2 Organization Chart

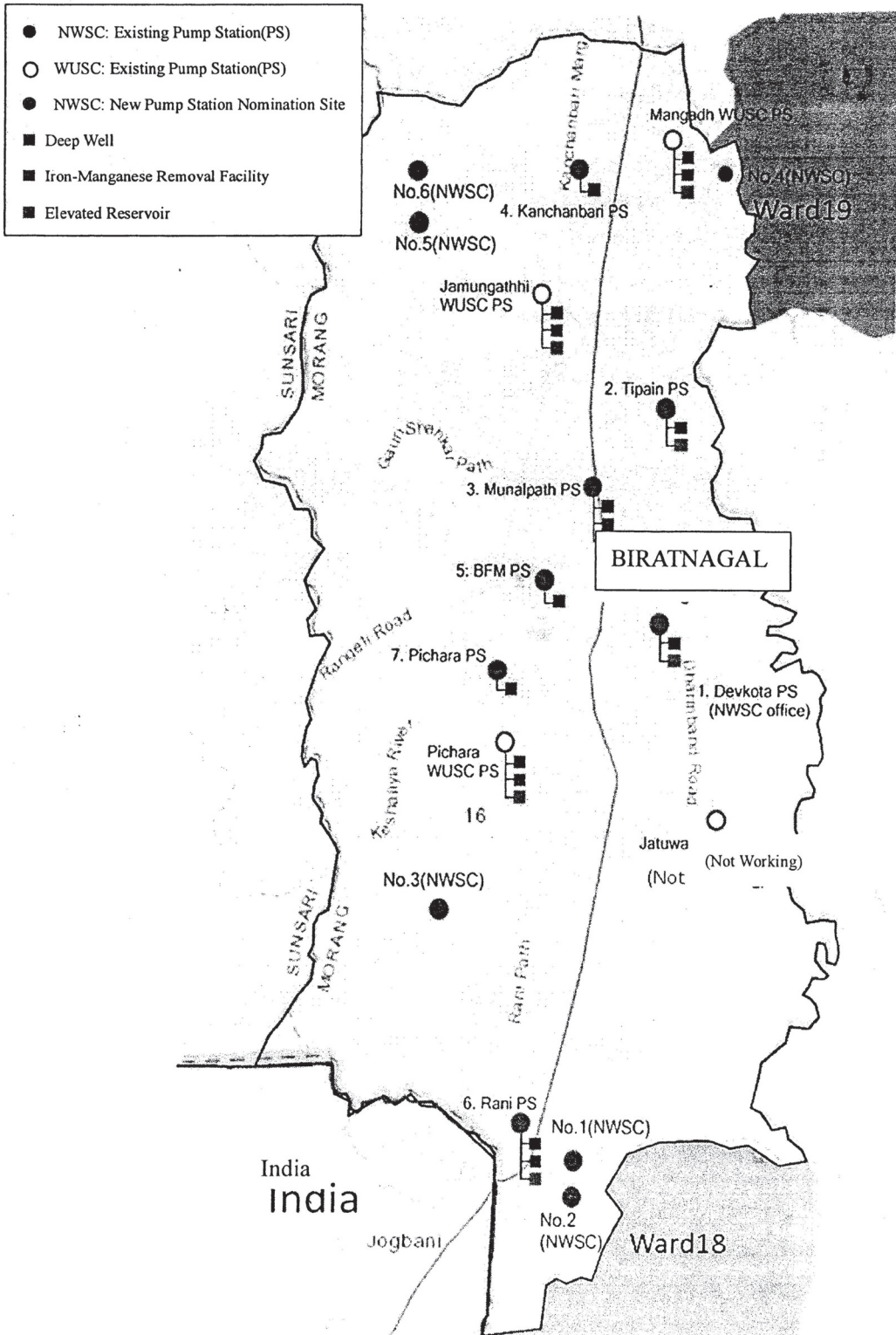
Annex 3 Japanese Grant

Annex 4 Project Monitoring Report

Annex 5 Major Undertakings to be taken by the Government of Nepal.



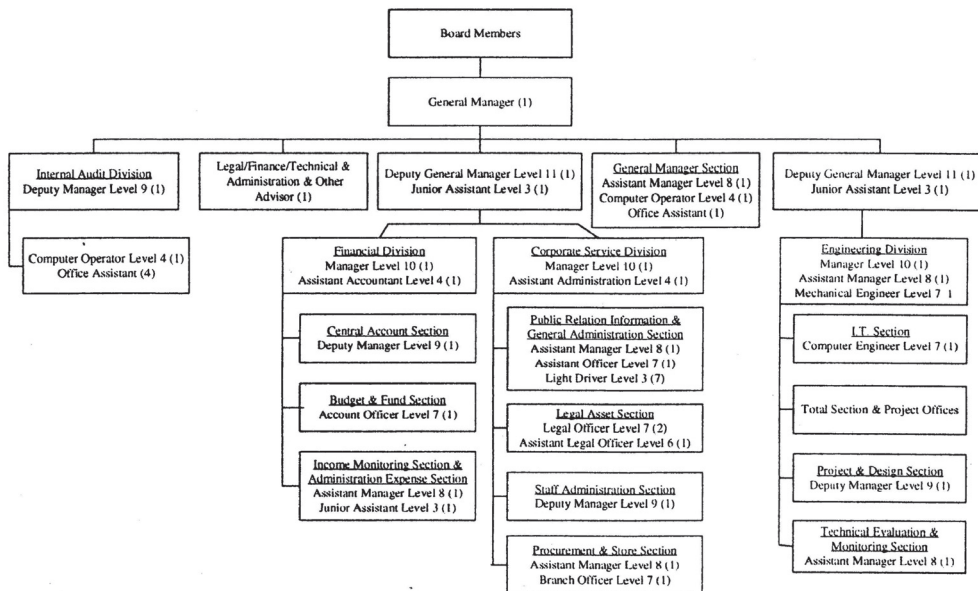




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Source: NWSC

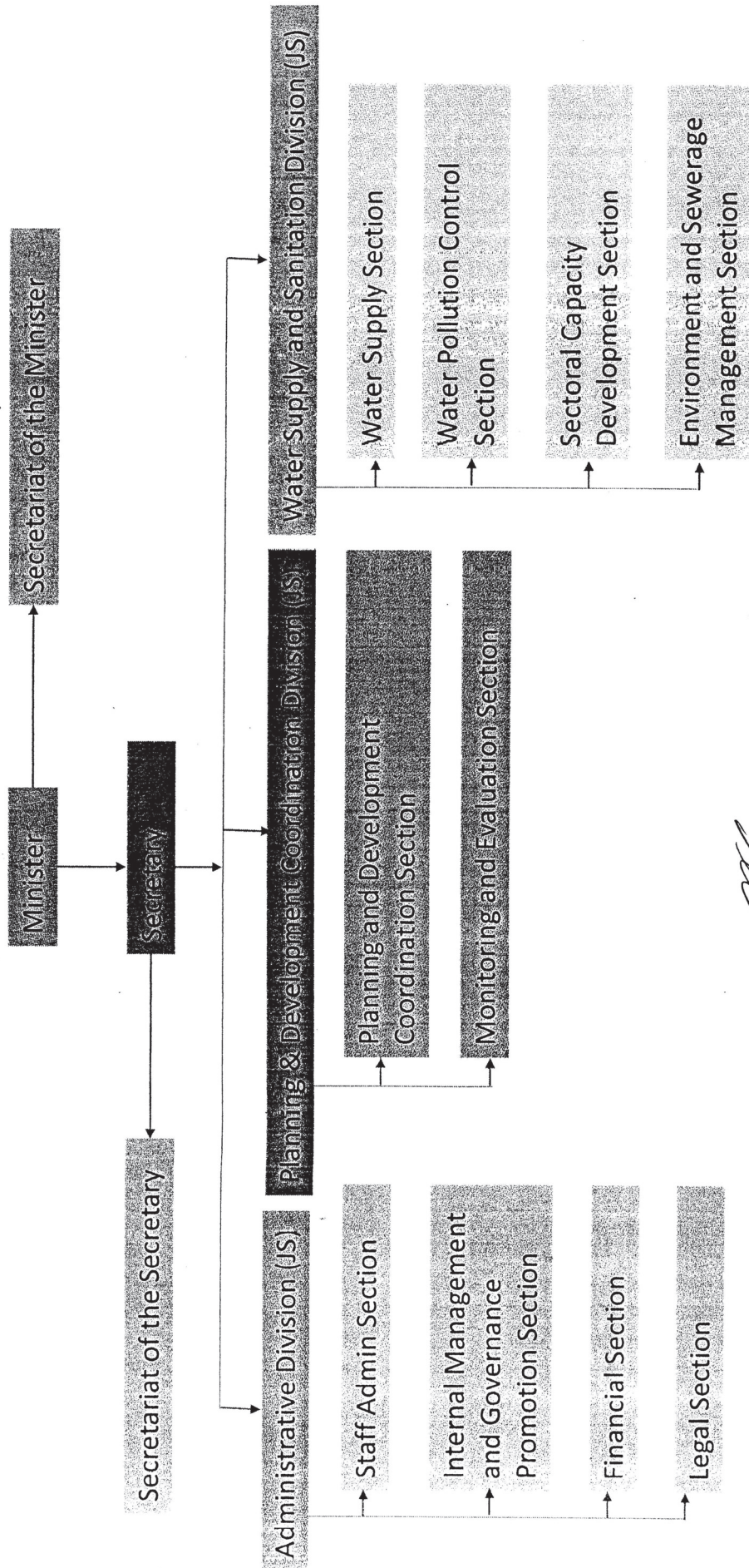
NWSC Head Quarter Organogram

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# Organogram of Ministry of Water Supply (MOWS)



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## JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as “the Recipient”) to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as “Project Grants”).

### 1. Procedures of Project Grants

Project Grants are conducted through following procedures (See “PROCEDURES OF JAPANESE GRANT” for details):

#### (1) Preparation

- The Preparatory Survey (hereinafter referred to as “the Survey”) conducted by JICA

#### (2) Appraisal

- Appraisal by the government of Japan (hereinafter referred to as “GOJ”) and JICA, and Approval by the Japanese Cabinet

#### (3) Implementation

##### Exchange of Notes

- The Notes exchanged between the GOJ and the government of the Recipient Grant Agreement (hereinafter referred to as “the G/A”)
- Agreement concluded between JICA and the Recipient

##### Banking Arrangement (hereinafter referred to as “the B/A”)

- Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as “the Bank”) to receive the grant

##### Construction works/procurement

- Implementation of the project (hereinafter referred to as “the Project”) on the basis of the G/A

#### (4) Ex-post Monitoring and Evaluation

- Monitoring and evaluation at post-implementation stage



## 2. Preparatory Survey

### (1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the Recipient necessary for the implementation of the Project.
- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

### (2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

### (3) Result of the Survey

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JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

### 3. Basic Principles of Project Grants

#### (1) Implementation Stage

##### 1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."

##### 2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

- a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.
- b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

##### 3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

##### 4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

##### 5) Eligible source country

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In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures

The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.

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- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.

2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.





3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.

4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

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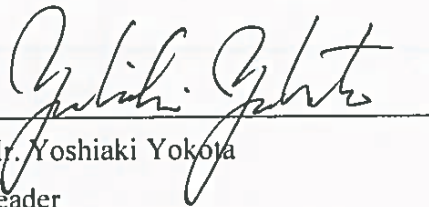
**資料-4-2 第 2 回現地調査協議議事録 (M/D)**



**Minutes of Discussions  
on the Preparatory Survey for the Project for  
Improvement of Water Supply System in Biratnagar**

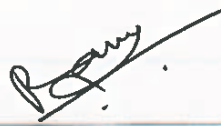
Based on the several preliminary discussions between the Government of Federal Democratic Republic of Nepal (hereinafter referred to as "Nepal") and Embassy of Japan with reference to the No. NEA/JPN-31(634)/2076/77/5615 dated on 10 December, 2019, Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team (hereinafter referred to as "the Team") for the Second Field Survey for the Project for Improvement of Water Supply System in Biratnagar (hereinafter referred to as "the Project") to Nepal. The Team held a series of discussions with the officials of the Government of Nepal and conducted a field survey. In the course of the discussions, both sides have confirmed the main items described in the attached sheets.

Kathmandu, 4<sup>th</sup> February, 2020



Mr. Yoshiaki Yokota  
Leader

Preparatory Survey Team  
Japan International Cooperation Agency  
(JICA)  
Japan



Er. Ramakanta Duwadi  
Joint Secretary  
Ministry of Water Supply (MoWS)  
Nepal



(Witnessed by)



Dr. Bhupendra Prasad  
General Manager  
Nepal Water Supply Corporation  
(NWSC), Nepal



Mr. Ekadev Adhikari  
Chief Administrative Officer  
Biratnagar Metropolitan City (BMC)

## ATTACHMENT

### 1. The Scope of the Project

- 1-1. The both sides confirmed that the Team will further conduct detail survey targeting the central area of BMC as shown in **Annex-1** to prepare the outline design of the Project, where;
- water supply services are presently provided by NWSC.
  - population density is high, and
  - many customer complaints on water quality, supply pressure and supply hour were identified during the first field survey.
- 1-2. The both sides confirmed that the scope of the Project will mainly consist of the following works within the above target survey area:
- new well facilities,
  - water treatment facilities for Fe and Mn removal as well as chlorination.
  - distribution facilities such as ground water tanks, pumping facilities and elevated water tanks, and
  - distribution pipes (both rehabilitation and augmentation)
- 1-3. The both sides agreed that the exact area and scope covered by Japanese Grant Project will be determined within the target survey area based on the preparatory survey results at the explanation on the draft preparatory survey report in August 2020. The final decision of the area and scope of the Project will be, however, made by the Government of Japan.
- 1-4. The Nepal side emphasized the necessity of covering all areas within proposed survey area due to social, technical and financial reasons and requested Japanese side to consider such need while determining the project components. Both sides agreed that in case there are any scopes or items which are not covered by the Japanese Grant Project within the target survey area, the Nepal side will make every effort for the implementation of such scope and items.

### 2. Responsible authority for the Project

Both sides confirmed again the authorities responsible for the Project are as follows:

- 2-1. Ministry of Water Supply (MoWS) will be the executing agency for the Project (hereinafter referred to as “the Executing Agency”). The Executing Agency shall coordinate with all the relevant authorities including Biratnagar Metropolitan City Government (BMC) to ensure smooth implementation of the Project and the undertakings for the Project shall be managed by relevant authorities

4-5



2



properly and on time.

- 2-2. The authorities responsible as the implementing agency for the Project will be Nepal Water Supply Corporation (NWSC). Implementing agency shall operate and maintain the Project facilities after the construction.

However, BMC, NWSC and Water User and Sanitation Committees (WUSCs) had discussion several times on the future operation and management modality of water supply systems in Biratnagar city. Although the conclusion has not been reached yet, it was confirmed that the Government of Nepal will formulate a single governing modality in near future. It was also confirmed that whatsoever the operation and management bodies would be in future, BMC and stakeholders would set up a proper institutional arrangement for operation and management of the Project in consultation with MoWS so as to get optimum benefits from the Project.

### 3. Other Relevant Issues

#### 3-1. Handover of Test Tube Well to NWSC

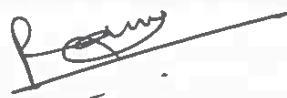
The Team will drill a test tube well to confirm groundwater availability during the preparatory survey, and after the test the Team will hand it over to NWSC to utilize the well as the monitoring well for the groundwater level. The Nepal side agreed that NWSC should take all the responsibilities for protecting and maintaining the well properly, and monitor the groundwater level periodically after the project. The Japanese side will consider to include the provision of a water level detector into the Project scope, and the Nepal side will report the monitoring results of groundwater level to JICA by using the monitoring form to be confirmed in the minutes at the draft report explanation in August 2020.

#### 3-2. Staff in NWSC Biratnagar

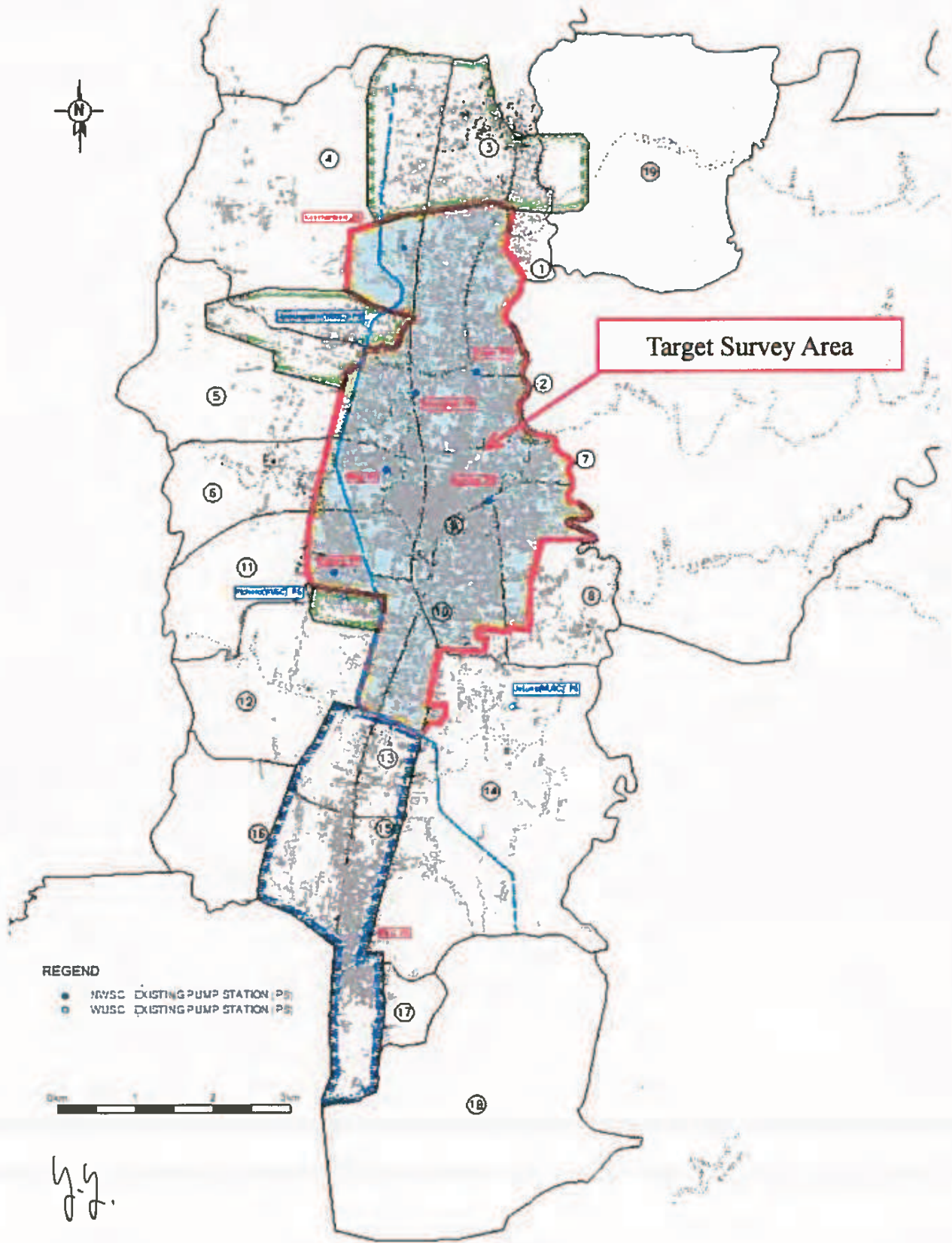
The Nepal side agreed to allocate sufficient number of staff members with appropriate capabilities in NWSC Biratnagar according to the preparatory survey report to be discussed in the survey.

Annex-1 Map of Target Survey Area

y.g.



gpe.



**REGENO**

- HWSC EXISTING PUMP STATION (P)
- WUSC EXISTING PUMP STATION (P)



*S.P.*

*K. Lee*

*Ray*

*Edy*



**資料-4-3 概略設計概要説明協議議事録 (M/D)**




**Minutes of Discussions**  
**on the Preparatory Survey for the Project for**  
**Improvement of Water Supply System in Biratnagar**  
**(Explanation on Draft Preparatory Survey Report)**

With reference to the minutes of discussions signed between Ministry of Water Supply, Nepal Water Supply Corporation and the Japan International Cooperation Agency (hereinafter referred to as "JICA") on 8 November, 2019 and 4 February, 2020 and in response to the request from the Government of Federal Democratic Republic of Nepal (hereinafter referred to as "Nepal") dated on 10 December, 2019, JICA and the Nepal side held online conference for the explanation of Draft Preparatory Survey Report (hereinafter referred to as "the Draft Report") for the Project for Improvement of Water Supply System in Biratnagar (hereinafter referred to as "the Project").

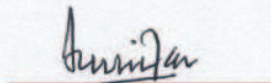
As a result of the discussions, both sides agreed on the main items described in the attached sheets.

Kathmandu, 3<sup>rd</sup> September, 2021

Tokyo, 3<sup>rd</sup> September, 2021

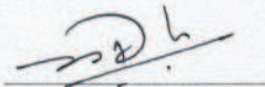


Mr. Yoichi INOUE  
Leader  
Preparatory Survey Team  
Japan International Cooperation Agency  
Japan

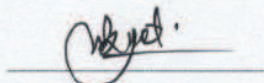


Mr. Sunil Das  
Joint Secretary  
Ministry of Water Supply (MoWS)  
Nepal

(Witnessed by)



Dr. Bhupendra Prasad  
General Manager  
Nepal Water Supply Corporation (NWSC)  
Nepal



Mr. Umesh Basnet  
Chief Administrative Officer  
Biratnagar Metropolitan City (BMC)  
Nepal

## ATTACHMENT

### 1. Project site

Both sides confirmed that the site of the Project is in the central area of Biratnagar Metropolitan City (hereinafter referred to as "BMC"), which is shown in Annex 1.

### 2. Contents of the Draft Report

After the explanation of the contents of the Draft Report by JICA side, the Nepal side agreed to its contents. JICA will finalize the Preparatory Survey Report based on the confirmed items. The report will be sent to the Nepal side around December, 2021.

### 3. Cost estimate

Both sides confirmed that the cost estimate including the contingency explained by JICA side is provisional and will be examined further by the Government of Japan for its approval. The contingency would cover the additional cost against natural disaster, unexpected natural conditions, etc.

### 4. Confidentiality of the cost estimate and technical specifications

Both sides confirmed that the cost estimate and technical specifications of the Project should never be disclosed to any third parties until all the contracts under the Project are concluded.

### 5. Procedures and Basic Principles of Japanese Grant

The Nepal side agreed that the procedures and basic principles of Japanese Grant (hereinafter referred to as "the Grant") as described in Annex 2 shall be applied to the Project. In addition, the Nepal side agreed to take necessary measures according to the procedures.

### 6. Timeline for the project implementation

JICA side explained to the Nepal side that the expected timeline for the project implementation is as attached in Annex 3.

### 7. Expected outcomes and indicators

Both sides agreed that key indicators for expected outcomes are as follows. The Nepal side will be responsible for the achievement of agreed key indicators targeted in year 2027 and shall monitor the progress for Ex-post Evaluation based on those

indicators.

[Quantitative indicators]

Indicator	Baseline Data (Year 2020)	Target (Year 2027) 【3 years after completion of the new facilities】
Drinking water quality (Residual chlorine, iron and manganese) (mg/l)※1	Residual chlorine: Less than 0.1 Iron : Max. 0.53 Manganese : Max. 0.48	Residual chlorine: More than 0.1 Iron : Less than 0.3 Manganese : Less than 0.2
Served Population (Persons)	52,000	93,000
Average water supply volume per day (m <sup>3</sup> /day)※2	9,000	15,000

\*1 The target is based on the target of Nepal drinking water quality standard.

\*2 Actual volume at the project area by operation hour of well pumps(exclude Kanchanbari pump station & Rani pump station)

[Qualitative effect]

- Recovery of satisfactory for NWSC's water
- Decrease of water-borne diseases
- Improvement in living environment of Biratnagar

#### 8. Ex-Post Evaluation

JICA will conduct ex-post evaluation after three (3) years from the project completion in principle, with respect to five evaluation criteria (Relevance, Effectiveness, Efficiency, Impact, and Sustainability). The result of evaluation will be publicized. The Nepal side will be required to monitor the Project and provide necessary support for the data collection.

#### 9. Technical assistance (“Soft Component” of the Project)

Considering the sustainable operation and maintenance of the products and services granted through the Project, following technical assistance is planned under the Project.

- Technical guidance for operation and management of Water Treatment Facility (Fe/Mn removal facility and Chemical injection facility)
- Technical guidance for operation and management of Water Distribution System

NWSC confirmed to deploy necessary number of counterparts who are appropriate and competent in terms of its purpose of the technical assistance as described in the Draft Report.

#### 10. Undertakings of the Project

Both sides confirmed the undertakings of the Project as described in Annex 4. With regard to exemption of customs duties, internal taxes and other fiscal levies as stipulated in (2) During the Project Implementation No.5 of Annex 4, both sides confirmed that such customs duties, internal taxes and other fiscal levies, which shall be clarified in the bid documents by NWSC during the implementation stage of the Project.

The Nepal side assured to take the necessary measures and coordination including allocation of the necessary budget which are preconditions of implementation of the Project. It is further agreed that the costs are indicative, i.e. at Outline Design level. More accurate costs will be calculated at the Detailed Design stage.

Both sides also confirmed that the Annex 4 will be used as an attachment of G/A.

Both sides confirmed that NWSC shall take necessary measures to ensure and maintain the security of the Project site and the persons related to the implementation of the Project, in cooperation with relevant authorities during the Project period. Such security measures shall reasonably reflect the needs of the Consultant/the Contractor engaging in the Project, as shown in Annex 4.

Both sides agreed that in case the additional security cost would be necessary for the implementation of the Project, such cost shall be borne by the Recipient without using the Grant.

#### 11. Monitoring during the implementation

The Project will be monitored by NWSC and reported to JICA by using the form of Project Monitoring Report (PMR) attached as Annex 5. The period for submission of the PMR is described in Annex 5.

#### 12. Project completion

Both sides confirmed that the project completes when all the facilities constructed and equipment procured by the Grant are in operation. The completion of the Project

will be reported to JICA by NWSC promptly, but in any event not later than six months after completion of the Project.

### **13. Environmental and Social Considerations**

#### **13-1. General Issues**

##### **13-1-1. Environmental Guidelines and Environmental Category**

JICA side explained that 'JICA Guidelines for Environmental and Social Considerations (June 2016)' (hereinafter referred to as "the Guidelines") is applicable for the Project. The Project is categorized as "B" because the Project is not likely to have significant adverse impact on the environment under the Guidelines in terms of its sectors, characteristics and areas.

##### **13-1-2. Environmental Checklist**

The environmental and social considerations including major impacts and mitigation measures for the Project are summarized in the Environmental Checklist attached as Annex 6. Both sides confirmed that in case of major modification of the Environmental Checklist, the Nepal side shall submit the modified version to JICA in a timely manner.

#### **13-2. Environmental Issues**

##### **13-2-1. Initial Environmental Examination (IEE)**

Both sides confirmed the IEE report will be approved by November 2021.

##### **13-2-2. Environmental Management Plan and Environmental Monitoring Plan**

Both sides confirmed Environmental Management Plan (hereinafter referred to as "EMP") and Environmental Monitoring Plan (hereinafter referred to as "EMoP") of the Project is attached as Annex 7, respectively. Both sides agreed that environmental mitigation measures and monitoring shall be conducted based on the EMP and EMoP, which may be updated during the Detailed Design stage.

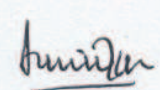
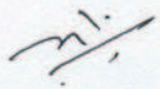
#### **13-3. Environmental and Social Monitoring**

##### **13-3-1. Environmental Monitoring**

Both sides agreed that the Nepal side shall submit results of environmental monitoring to JICA with PMR by using the monitoring form attached as Annex 8. The timing of submission of the monitoring form is described in Annex 4.

##### **13-3-2. Information Disclosure of Monitoring Results**

Both sides confirmed that the Nepal side shall disclose the results of environmental



monitoring to local stakeholders through their website / in their field offices.

The Nepal side agreed JICA will disclose results of environmental monitoring submitted by the Nepal side as the monitoring forms attached as Annex 6 on its website.

#### 14. Other Relevant Issues

##### 14-1. Disclosure of Information

Both sides confirmed that the Preparatory Survey Report from which project cost is excluded will be disclosed to the public after completion of the Preparatory Survey. The comprehensive report including the project cost will be disclosed to the public after all the contracts under the Project are concluded.

##### 14-2 Approval of IEE

The Nepal side explained that IEE approval will be completed by November 2021. The both side confirmed that the Nepal side will submit the certificate of IEE approval to JICA Nepal Office by the end of November 2021.

##### 14-3 Assignment of staff in project site

The Nepal side agreed to assign necessary staff in project site as below for Operation and Maintenance of the Project. The both side confirmed that seven (7) more staff will be required in project site.

Item	Frequency of washing & maintenance	Required number of operator		Remarks
		Current Situation	After the Project	
<b>Pump Station</b>				
Daily operation management (including operation management of pump equipment and filtration facility, dissolution of chemicals, etc.)	Every Day	4 operators (1 operator/PS)	8 operators (2 operators/PS) Additional 4 staffs	Increase staffs
Water quality management (including sampling and analysis, management of chemical dosing rate, etc.)	Every Day	-	1 operator/4 PSs Additional 1 staff	Increase staffs
<b>Water Distribution Pipeline</b>				
Maintenance of pipeline	implement a timely	1 operator (Manager for whole pipeline)	1 operator (Manager for whole pipeline)	Current Manager
Leakage inspection	Every Day	-	2 operators Additional 2 staffs	Increase staffs



The Nepal side also agreed to allocate necessary staff to receive On-The-Job training (OJT) and Soft Component.

#### **14-4 Allocation of Budget for Operation and maintenance of the Project**

The Nepal side agreed to allocate necessary budget to NWSC Biratnagar branch for operation and maintenance of the Project. Necessary annual cost for Operation and Maintenance for the Project is estimated as 28,441,000NPR.

#### **14-5 House connections to pipelines to be installed in the Project by NWSC**

The Nepal side agreed to conduct house connections to pipelines to be installed in the Project which will cost 20,369,000 NPR. The both side confirmed house connections to pipelines will be conducted during and after the project and will be completed at latest within three years after the Project completion.

#### **14-6 Permission of construction facility**

The Nepal side confirmed to obtain permit from the authorities related to all construction facility including pipe laying work and excavation of national road.

#### **14-7 Deposit for Excavation of National road**

The Japan side to request the Nepal side to exempt the necessary deposit for excavation of national road, because the restoration of the road will be conducted in the Project. The exemption should be finalized before the notice of bidding documents for the Project. The Nepal side agreed upon it and will exempt the deposit from the Japanese contractor.

#### **14-8 Suggestions related to the Project**

- 1) Replacement of inappropriate water meter  
25% of water meters are damaged or defect according to the interview survey. Only basic charges are collected from customers with a damaged water meter, and customers with no water meter pay a fixed price. Appropriate meter should be installed.
- 2) Expansion of water supply zones beyond the project with BMC under a single governing modality, especially house connections around New No.5 Pump station area.
- 3) Facilitation and provision of support to house lessees for permission of new

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connection

Annex 1 Project site

Annex 2 Japanese Grant

Annex 3 Project Implementation Schedule

Annex 4 Major Undertakings to be taken by the Government of Nepal

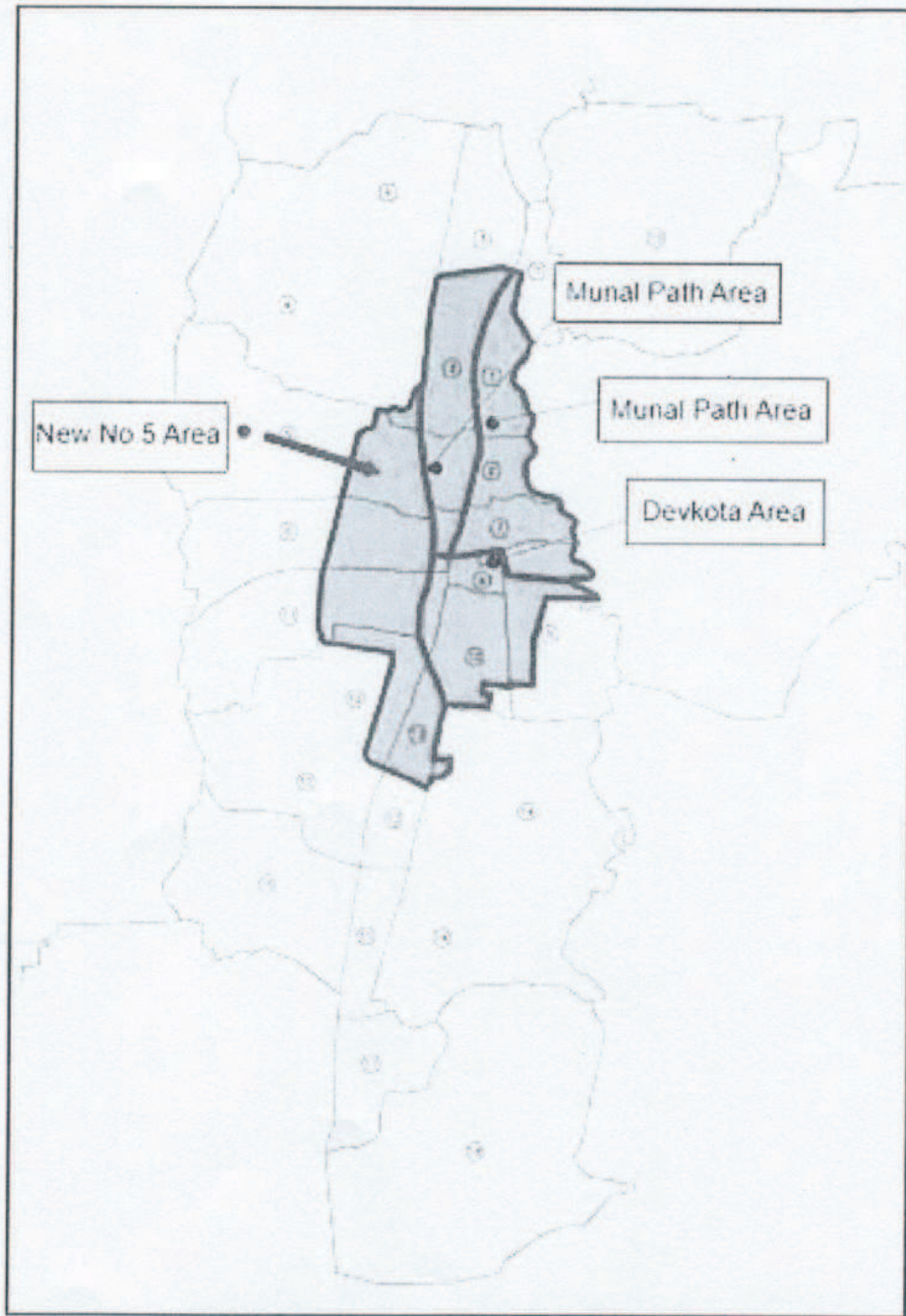
Annex 5 Project Monitoring Report

Annex 6 Environmental Check List

Annex 7 Environmental Management Plan and Environmental Monitoring Plan

Annex 8 Environmental and Social Monitoring Form

Project site (Colored area only)



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## JAPANESE GRANT

The Japanese Grant is non-reimbursable fund provided to a recipient country (hereinafter referred to as "the Recipient") to purchase the products and/or services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. Followings are the basic features of the project grants operated by JICA (hereinafter referred to as "Project Grants").

## 1. Procedures of Project Grants

Project Grants are conducted through following procedures (See "PROCEDURES OF JAPANESE GRANT" for details):

## (1) Preparation

- The Preparatory Survey (hereinafter referred to as "the Survey") conducted by JICA

## (2) Appraisal

- Appraisal by the government of Japan (hereinafter referred to as "GOJ") and JICA, and Approval by the Japanese Cabinet

## (3) Implementation

## Exchange of Notes

- The Notes exchanged between the GOJ and the government of the Recipient

## Grant Agreement (hereinafter referred to as "the G/A")

- Agreement concluded between JICA and the Recipient

## Banking Arrangement (hereinafter referred to as "the B/A")

- Opening of bank account by the Recipient in a bank in Japan (hereinafter referred to as "the Bank") to receive the grant

## Construction works/procurement

- Implementation of the project (hereinafter referred to as "the Project") on the basis of the G/A

## (4) Ex-post Monitoring and Evaluation

- Monitoring and evaluation at post-implementation stage

## 2. Preparatory Survey

## (1) Contents of the Survey

The aim of the Survey is to provide basic documents necessary for the appraisal of the the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of

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relevant agencies of the Recipient necessary for the implementation of the Project.

- Evaluation of the feasibility of the Project to be implemented under the Japanese Grant from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of an outline design of the Project.
- Estimation of costs of the Project.
- Confirmation of Environmental and Social Considerations

The contents of the original request by the Recipient are not necessarily approved in their initial form. The Outline Design of the Project is confirmed based on the guidelines of the Japanese Grant.

JICA requests the Recipient to take measures necessary to achieve 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 executing agency of the Project. Therefore, the contents of the Project are confirmed by all relevant organizations of the Recipient based on the Minutes of Discussions.

#### (2) Selection of Consultants

For smooth implementation of the Survey, JICA contracts with (a) consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

#### (3) Result of the Survey

JICA reviews the report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the feasibility of the Project.

### 3. Basic Principles of Project Grants

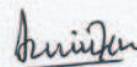
#### (1) Implementation Stage

##### 1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes (hereinafter referred to as "the E/N") will be signed between the GOJ and the Government of the Recipient to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Recipient to define the necessary articles, in accordance with the E/N, to implement the Project, such as conditions of disbursement, responsibilities of the Recipient, and procurement conditions. The terms and conditions generally applicable to the Japanese Grant are stipulated in the "General Terms and Conditions for Japanese Grant (January 2016)."



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2) Banking Arrangements (B/A) (See "Financial Flow of Japanese Grant (A/P Type)" for details)

a) The Recipient shall open an account or shall cause its designated authority to open an account under the name of the Recipient in the Bank, in principle. JICA will disburse the Japanese Grant in Japanese yen for the Recipient to cover the obligations incurred by the Recipient under the verified contracts.

b) The Japanese Grant will be disbursed when payment requests are submitted by the Bank to JICA under an Authorization to Pay (A/P) issued by the Recipient.

3) Procurement Procedure

The products and/or services necessary for the implementation of the Project shall be procured in accordance with JICA's procurement guidelines as stipulated in the G/A.

4) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the Recipient to continue to work on the Project's implementation after the E/N and G/A.

5) Eligible source country

In using the Japanese Grant disbursed by JICA for the purchase of products and/or services, the eligible source countries of such products and/or services shall be Japan and/or the Recipient. The Japanese Grant may be used for the purchase of the products and/or services of a third country as eligible, if necessary, taking into account the quality, competitiveness and economic rationality of products and/or services necessary for achieving the objective of the Project. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm, which enter into contracts with the Recipient, are limited to "Japanese nationals", in principle.

6) Contracts and Concurrence by JICA

The Recipient will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be concurred by JICA in order to be verified as eligible for using the Japanese Grant.

7) Monitoring

The Recipient is required to take their initiative to carefully monitor the progress of the Project in order to ensure its smooth implementation as part of their responsibility in the G/A, and to regularly report to JICA about its status by using the Project Monitoring Report (PMR).

8) Safety Measures


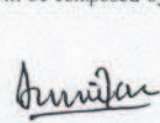
The Recipient must ensure that the safety is highly observed during the implementation of the Project.

9) Construction Quality Control Meeting

Construction Quality Control Meeting (hereinafter referred to as the "Meeting") will be held for quality assurance and smooth implementation of the Works at each stage of the Works. The member of the Meeting will be composed by the



資料-4-81



Recipient (or executing agency), the Consultant, the Contractor and JICA. The functions of the Meeting are as followings:

- a) Sharing information on the objective, concept and conditions of design from the Contractor, before start of construction.
- b) Discussing the issues affecting the Works such as modification of the design, test, inspection, safety control and the Client's obligation, during of construction.

(2) Ex-post Monitoring and Evaluation Stage

- 1) After the project completion, JICA will continue to keep in close contact with the Recipient in order to monitor that the outputs of the Project is used and maintained properly to attain its expected outcomes.
- 2) In principle, JICA will conduct ex-post evaluation of the Project after three years from the completion. It is required for the Recipient to furnish any necessary information as JICA may reasonably request.

(3) Others

1) Environmental and Social Considerations

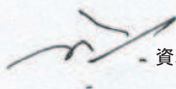
The Recipient shall carefully consider environmental and social impacts by the Project and must comply with the environmental regulations of the Recipient and JICA Guidelines for Environmental and Social Considerations (April, 2010).

2) Major undertakings to be taken by the Government of the Recipient

For the smooth and proper implementation of the Project, the Recipient is required to undertake necessary measures including land acquisition, and bear an advising commission of the A/P and payment commissions paid to the Bank as agreed with the GOJ and/or JICA. The Government of the Recipient shall ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the Recipient with respect to the purchase of the Products and/or the Services be exempted or be borne by its designated authority without using the Grant and its accrued interest, since the grant fund comes from the Japanese taxpayers.

3) Proper Use

The Recipient is required to maintain and use properly and effectively the products and/or services under the Project (including the facilities constructed and the equipment purchased), to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Japanese Grant.



4) Export and Re-export

The products purchased under the Japanese Grant should not be exported or re-exported from the Recipient.

*yu*

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Amifan

*(Signature)*





## Major Undertakings to be taken by the Government of Nepal

## 1. Specific obligations of the Government of Nepal which will not be funded with the Grant

## (1) Before the Tender

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To sign the banking arrangement (B/A) with a bank in Japan (the Agent Bank) to open bank account for the Grant	within 1 month after the signing of the G/A	NWSC		
2	To issue A/P to the Agent Bank for the payment to the consultant	within 1 month after the signing of the contract(s)	NWSC		
3	To bear the following commissions to the Agent Bank for the banking services based upon B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	NWSC		
	2) Payment commission for A/P	every payment	NWSC		
4	To approve IEE(Conditions of approval should be fulfilled, if any) and secure the necessary budget for implementation for EMP and EMoP (and fulfilling conditions of approval, if any).	within 1 month after the signing of the G/A	MoWS		
5	NWSC will be assigned as the implementation agency by MoF through a written document.	before notice of the bidding documents	MOF		
6	To implement land acquisition for construction site (New No.5 PS) through proper legal procedures	before notice of the bidding documents	NWSC BMC		
7	To explain about the Project to the residents living near the facility construction site through a stake holder meeting	before notice of the bidding documents	NWSC		
8	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	until land acquisition	NWSC		
9	To clear the following sites by removing the existing facilities and materials from the planned construction site and to level the land 1) Existing Ware House at Devkota PS 2) Retaining Wall at Tinpaini PS	before start of the construction	NWSC	196,000 NPR	
10	To obtain permit from the authorities related to all construction facility including pipe laying work. Especially, obtaining permission for the excavation of national road from and deposit exemption.	before notice of the bidding documents	NWSC BMC		

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

## (2) During the Project Implementation

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To issue A/P to the Agent Bank for the payment to the supplier and the contractor	within 1 month after the signing of the contract(s)	NWSC		
2	To bear the following commissions to the Agent Bank for the banking services based upon the B/A				
	1) Advising commission of A/P	within 1 month after the signing of the contract(s)	NWSC		
	2) Payment commission for A/P	every payment	NWSC		
3	To ensure prompt customs clearance and to assist the Contractor(s) with internal transportation in the country of the Recipient	during the Project	NWSC		
4	To accord Japanese physical persons and/or physical persons of third countries whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the country of the Recipient and stay therein for the performance of their work	during the Project	NWSC		
5	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the country of the Recipient with respect to the purchase of the products and/or the services be exempted by its designated authority without using the Grant	during the Project	NWSC		
6	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project	during the Project	NWSC		
7	To notify JICA promptly of any incident or accident, which has, or is likely to have, a significant adverse effect on the environment, the affected communities, the public or workers.	during the construction	NWSC		
8	To submit Project Monitoring Report	quarterly basis	NWSC		
9	To submit Project Monitoring Report (final) (including as-built drawings, equipment list, photographs, etc.)	within 1 month after issuance of Certificate of Completion for the works under the contract(s)	NWSC		
10	To submit a report concerning completion of the Project	within 6 months after completion of the Project	NWSC		
11	To install fences and gates around the yards for pump stations	before start of the construction	NWSC	5,912,000 NPR	
12	To provide facilities for distribution of electricity and and water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the site(s)				
	1) Electricity To connect a power cable required for pump stations (The facilities after the power receiving facilities are the scope of the Japanese side) (Necessary Arrange with NEA)	before trial operation of facilities	NWSC	17,057,000 NPR	
	2) Water supply To manufacture concrete	during the project	NWSC		
	3) Drainage To develop and maintain a drainage channel from the new pump station to discharge point (New No.5 PS)	during the project	NWSC	5,754,000 NPR	

	4) Furniture To set new administration building in No.5 PS from other PS that no longer be used or existing furniture in office	before completion of the construction	NWSC		
13	To secure temporary yard for construction materials and storage area for surplus soils. And to burden of expenses for the disposal of surplus soil.	during the project	NWSC BMC		
14	To conduct house connection to pipeline to be installed in the Project	during and after the Project	NWSC	20,369,000 NPR	
15	To repair to existing pipeline causing water leakage other than pipeline to be installed by the Project and exchange water meters by self-help effort	during the Project	NWSC		
16	To assign engineers, staff and operators to receive OJT for improvement of O&M and water quality control and Soft Component (technical and/or managerial assistance) for the proper operation and maintenance for pump stations to be constructed under the Project	during the Project	NWSC		
17	To ensure the safety of persons engaged in the implementation of the Project	during the Project	NWSC		
18	To take necessary measures for security and safety of the Project site, i.e. traffic control around the site(s) and on transportation routes of construction materials	during the construction	NWSC BMC		
19	To implement EMP and EMoP	during the construction	NWSC		
20	To submit results of environmental monitoring to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report	during the construction	NWSC		
21	To implement social monitoring, and to submit the monitoring results to JICA, by using the monitoring form, on a quarterly basis as a part of Project Monitoring Report - Period of the monitoring may be extended if affected persons' livelihoods are not sufficiently restored. Extension of the monitoring will be decided based on agreement between NWSC and JICA.	during the construction	NWSC		

(3) After the Project

NO	Items	Deadline	In charge	Estimated Cost	Ref.
1	To continue construction of house connection to pipeline to be installed in the Project	After the Project	NWSC		
2	To repair to existing pipeline causing water leakage other than pipeline to be installed by the Project and exchange water meters by self-help effort	After the Project	NWSC		
3	To implement EMP and EMoP	for a period based on EMP and EMoP	NWSC		
4	To submit results of environmental monitoring to JICA, by using the monitoring form, semiannually - The period of environmental monitoring may be extended if any significant negative impacts on the environment are found. The extension of environmental monitoring will be decided based on the agreement between NWSC and JICA.	for 3 years after the Project	NWSC		

*Yc*

資料-4-37

*Amidon*

*(Signature)*

5	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid 1) Allocation of maintenance cost 2) Operation and maintenance structure Routine check/Periodic inspection	After completion of the construction	NWSC		
---	--	--------------------------------------	------	--	--

**2. Other obligations of the Government of Nepal funded with the Grant**

NO	Items	Deadline	Amount (Million Japanese Yen)*
1	1) To conduct the following transportation a) Marine(Air) transportation of the products from Japan to the country of the Recipient b) Internal transportation from the port of disembarkation to the project site 2) To construct pavement of in-plant road 3) To construct the temporary building 4) To provide facilities for the distribution of electricity, drainage and other incidental facilities 5) To provide facilities for water supply - Well facility - Raw water pipeline - Water treatment facility - Water reservoir - Pump building / Pump equipment - Overhead tank (New No.5 PS) - Administration building (New No.5 PS) - Chemical injection facility - Water distribution pipeline	project completion	
2	To implement detailed design, bidding support and construction supervision (Consulting Service)		
3	Contingencies		
	Total		2,495

\* The Amount is provisional. This is subject to the approval of the Government of Japan.

資料-4-38

**Project Monitoring Report**  
 on  
**Project Name**  
**Grant Agreement No. XXXXXXXX**  
 20XX, Month

**Organizational Information**

Signer of the G/A (Recipient)	Person in Charge (Designation) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____
Executing Agency	Person in Charge (Designation) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____
Line Ministry	Person in Charge (Designation) _____ Contacts _____ Address: _____ Phone/FAX: _____ Email: _____

**General Information:**

Project Title	
E/N	Signed date: Duration:
G/A	Signed date: Duration:
Source of Finance	Government of Japan: Not exceeding JPY _____ mil. Government of (_____): _____

資料 4-39






<b>1: Project Description</b>	
-------------------------------	--

**1-1 Project Objective**

--

**1-2 Project Rationale**

- Higher-level objectives to which the project contributes (national/regional/sectoral policies and strategies)
- Situation of the target groups to which the project addresses

--

**1-3 Indicators for measurement of "Effectiveness"**

Quantitative indicators to measure the attainment of project objectives		
Indicators	Original (Yr )	Target (Yr )
Qualitative indicators to measure the attainment of project objectives		

<b>2: Details of the Project</b>
----------------------------------

**2-1 Location**

Components	Original <i>(proposed in the outline design)</i>	Actual
1.		

**2-2 Scope of the work**

Components	Original* <i>(proposed in the outline design)</i>	Actual*
1.		

Reasons for modification of scope (if any).

(PMR)
-------

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2-3 Implementation Schedule

Items	Original		Actual
	<i>(proposed in the outline design)</i>	<i>(at the time of signing the Grant Agreement)</i>	

Reasons for any changes of the schedule, and their effects on the project (if any)

--

2-4 Obligations by the Recipient

2-4-1 Progress of Specific Obligations  
 See Attachment 2.

2-4-2 Activities  
 See Attachment 3.

2-4-3 Report on RD  
 See Attachment 11.

2-5 Project Cost

2-5-1 Cost borne by the Grant(Confidential until the Bidding)

Components			Cost (Million Yen)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
1.				
Total				

Note: 1) Date of estimation:  
 2) Exchange rate: 1 US Dollar = Yen

2-5-2 Cost borne by the Recipient

Components			Cost (1,000 Taka)	
	Original <i>(proposed in the outline design)</i>	Actual <i>(in case of any modification)</i>	Original <sup>1),2)</sup> <i>(proposed in the outline design)</i>	Actual
1.				

4

22

Sumijan

BJ



Note: 1) Date of estimation:  
2) Exchange rate: 1 US Dollar =

Reasons for the remarkable gaps between the original and actual cost, and the countermeasures (if any)

(PMR)

**2-6 Executing Agency**

- Organization's role, financial position, capacity, cost recovery etc,
- Organization Chart including the unit in charge of the implementation and number of employees.

<b>Original</b> (at the time of outline design) name: role: financial situation: institutional and organizational arrangement (organogram): human resources (number and ability of staff):
<b>Actual</b> (PMR)

**2-7 Environmental and Social Impacts**

- The results of environmental monitoring based on Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- The results of social monitoring based on in Attachment 5 (in accordance with Schedule 4 of the Grant Agreement).
- Disclosed information related to results of environmental and social monitoring to local stakeholders (whenever applicable).

**3: Operation and Maintenance (O&M)**

**3-1 Physical Arrangement**

- Plan for O&M (number and skills of the staff in the responsible division or section, availability of manuals and guidelines, availability of spareparts, etc.)

<b>Original</b> (at the time of outline design)
<b>Actual</b> (PMR)

**3-2 Budgetary Arrangement**

- Required O&M cost and actual budget allocation for O&M

**Original** (at the time of outline design)

Actual (PMR)

**4: Potential Risks and Mitigation Measures**

- Potential risks which may affect the project implementation, attainment of objectives, sustainability
- Mitigation measures corresponding to the potential risks

**Assessment of Potential Risks (at the time of outline design)**

Potential Risks	Assessment
1. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
2. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:
3. (Description of Risk)	Probability: High/Moderate/Low
	Impact: High/Moderate/Low
	Analysis of Probability and Impact:
	Mitigation Measures:
	Action required during the implementation stage:

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	Contingency Plan (if applicable):
Actual Situation and Countermeasures (PMR)	

**5: Evaluation and Monitoring Plan (after the work completion)**

**5-1 Overall evaluation**

Please describe your overall evaluation on the project.

--

**5-2 Lessons Learnt and Recommendations**

Please raise any lessons learned from the project experience, which might be valuable for the future assistance or similar type of projects, as well as any recommendations, which might be beneficial for better realization of the project effect, impact and assurance of sustainability.

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**5-3 Monitoring Plan of the Indicators for Post-Evaluation**

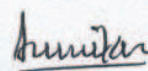
Please describe monitoring methods, section(s)/department(s) in charge of monitoring, frequency, the term to monitor the indicators stipulated in 1-3.

--

G/A NO. XXXXXXX  
PMR prepared on DD/MM/YY

Attachment

1. Project Location Map
  2. Specific obligations of the Recipient which will not be funded with the Grant
  3. Monthly Report submitted by the Consultant
- Appendix - Photocopy of Contractor's Progress Report (if any)
- Consultant Member List
  - Contractor's Main Staff List
4. Check list for the Contract (including Record of Amendment of the Contract/Agreement and Schedule of Payment)
  5. Environmental Monitoring Form / Social Monitoring Form
  6. Monitoring sheet on price of specified materials (Quarterly)
  7. Report on Proportion of Procurement (Recipient Country, Japan and Third Countries) (PMR (final) only)
  8. Pictures (by JPEG style by CD-R) (PMR (final) only)
  9. Equipment List (PMR (final) only)
  10. Drawing (PMR (final) only)
  11. Report on RD (After project)



Monitoring sheet on price of specified materials

1. Initial Conditions (Confirmed)

Items of Specified Materials	Initial Volume A	Initial Unit Price (¥) B	Initial total Price C=A×B	1% of Contract Price D	Condition of payment	
					Price (Decreased) E=C-D	Price (Increased) F=C+D
1 Item 1	●●t	●	●	●	●	●
2 Item 2	●●t	●	●	●		
3 Item 3						
4 Item 4						
5 Item 5						

2. Monitoring of the Unit Price of Specified Materials

(1) Method of Monitoring : ●●

(2) Result of the Monitoring Survey on Unit Price for each specified materials

Items of Specified Materials	1st month, 2015	2nd month, 2015	3rd month, 2015	4th	5th	6th
2 Item 2						
3 Item 3						
4 Item 4						
5 Item 5						

(3) Summary of Discussion with Contractor (if necessary)

*Amirfan*

*(B)*

Report on Proportion of Procurement (Recipient Country, Japan and Third Countries)  
 (Actual Expenditure by Construction and Equipment each)

	Domestic Procurement (Recipient Country) A	Foreign Procurement (Japan) B	Foreign Procurement (Third Countries) C	Total D
Construction Cost	(A/D%)	(B/D%)	(C/D%)	
Direct Construction Cost	(A/D%)	(B/D%)	(C/D%)	
others	(A/D%)	(B/D%)	(C/D%)	
Equipment Cost	(A/D%)	(B/D%)	(C/D%)	
Design and Supervision Cost	(A/D%)	(B/D%)	(C/D%)	
Total	(A/D%)	(B/D%)	(C/D%)	

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## Environmental Check List

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process?  (b) Have EIA reports been approved by authorities of the host country's government?  (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?  (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a) N (b) N (c) N (d) N	(a) (b) (c) (d) The Project is applied IEE (Schedule-1) scale under Environmental Protection Roues2076(2020) in Nepal, and IEE report(draft) is written by local Company to be approved by Ministry of Water Supply by November 2021.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the Local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the Local stakeholders?  (b) Have the comment from the stakeholders (such as local residents) been reflected to the project design?	(a) Y (b) Y	(a)(b) Several stakeholders, including the neighborhood and Ward Chairman in BMC, have been conducted in 27 February 2020, 2 March, 2020, and 5 March 2020.  The comments from the stakeholders have been taken into consideration to the project design.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a) Y	(a) Following 3 cases have been compared: 1.The case not to construct PS, and not to repair existing PSs 2.The case to construct PS, and to construct water treatment plants 3.The case to construct PS, but not to construct water treatment plant
2 Pollution Control	(1) Air Quality	(a) Is there a possibility that chlorine from chlorine storage facilities and chlorine injection facilities will cause air pollution? Are any mitigating measures taken?  (b) Do chlorine concentrations within the working environments comply with the country's occupational health and safety standards?	(a)(b) N	(a)(b) Storage shall be done in safe and leakage free storage tank.  There is no environmental standard of chlorine on air quality
	(2) Water Quality	(a) Do pollutants, such as SS, BOD, COD contained in effluents discharged by the facility operations comply with the country's effluent standards?	(a) Y	(a) Effluents will be discharged to public river, satisfying effluent standards in Nepal.

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
	(3) Wastes	(a) Are wastes, such as sludge generated by the facility operations properly treated and disposed in accordance with the country's regulations?	(a) Y	(a) Wastes are disposed to the landfill site, owned by BMC
	(4) Noise and Vibration	(a) Do noise and vibrations generated from the facilities, such as pumping stations comply with the country's standards?	(a) Y	(a) Noise is applied for values of Mixed Residential Area (Daytime: 63dB, Nighttime: 55dB) in environmental standard. There is no standard on vibration in Nepal.
	(5) Subsidence	(a) In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?	(a) N	(a) Pump capacity is controlled systematically not to exceed the limit amount of ground water pumping
3 Natural Environment	(1) Protected Areas	(a) Is the project site or discharge area located in protected areas designated by the country's laws or international treaties and conventions? (b) Is there a possibility that the project will affect the protected areas?	(a) N (b) N	(a) No national parks and cultural heritage are located near the construction site.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site or discharge area encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?	(a) N (b) N (c) N (d) N	(a)(b)(c)(d) The construction site is not located in forest area / conservation area with high value of ecological importance.
	(3) Hydrology	(a) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect surface water and groundwater flows?	(a) N	(a) The project will pump water that is deeper than water from aquifer used for existing hand pumps. Therefore, no impact to hydrogeology is assume

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Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
4 Social Environment	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Is the compensations going to be paid prior to the resettlement?</p> <p>(e) Is the compensation policies prepared in document? Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a)(b) (c)(d) (e)(f) (g)(h) (i)(j) N</p>	<p>(a)(b)(c)(d)(e)(f)(g)(h)(i)(j) The construction site of new PS is owned by BMC. Therefore, involuntary resettlement does not occur. NWSC will discuss with BMC for paying land lease fee.</p>
	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(b) Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect the existing water uses and water area uses?</p>	<p>(a) N (b) N</p>	<p>(a) Water distribution service by the Project will improve sanitation conditions in residential areas. (b) The project will pump water that is deeper than water from aquifer used for existing hand pumps. Therefore, no impact to hydrogeology is assume</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archaeological, historical,</p>	<p>(a) N</p>	<p>(a) The project area does not have any archaeological sites with historical and cultural value.</p>

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?		
	(4) Landscape	(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?	(a) N	(a) New elevated tanks may occur the impact to landscape, but the construction sites are not important areas in the view point of landscape
	(5) Ethnic Minorities and Indigenous Peoples	(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?  (b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?	(a)(b) N	(a)(b) No impact is anticipated for poor, indigenous, or ethnic people.
	(6) Working Conditions	(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?  (b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?  (c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?  (d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?	(a) (b) (c) (d) Y	(a)(b)(c)(d) Based on Labour Act 2074 in Nepal, The Contractor will make workers wear safety protector such as gloves, helmet, safety belts, etc
5 Others	(1) Impacts during Construction	(a) Are adequate measures considered to reduce impacts during construction (e.g., noise,	(a) Y (b) N (c) N (d) Y	(a) Water is discharged after catch basins of suspended solid not to pollute the river. If necessary, sprinkling water is provided to prevent dusts. Low noise /vibration models of construction machines are used for construction works.

*Signature*

*Signature*

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
		<p>vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>(d) If the construction activities might cause traffic congestion, are adequate measures considered to reduce such impacts?</p>		<p>(b)(c) No impacts to natural and social environment are anticipated.</p> <p>(d) Adequate time schedule is prepared for construction works not to concentrate construction vehicles in a particular time zone</p>
	(2) Monitoring	<p>(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>(b) What are the items, methods and frequencies of the monitoring program?</p> <p>(c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>(d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>(a) Y</p> <p>(b) Y</p> <p>(c) Y</p> <p>(d) Y</p>	<p>(a) Monitoring on effluent quality, harmful effects to the existing infrastructure, labor environment, and groundwater level are implemented.</p> <p>(b) During construction: Effluent quality is metered once per week. Impacts of construction vehicles to traffic conditions and labor environment are observed and reported according to monitoring sheet.</p> <p>During operation: Effluent quality is metered once per week. Groundwater level is metered once per month according to monitoring sheet.</p> <p>(c) The Contactor monitors the above conditions during construction. NWSC monitors the above conditions during operations. Such costs are included in construction and operation &amp; maintenance costs respectively.</p> <p>(d) According to the permission issued by MoFE, NWSC reports metered /observed conditions to MoFE.</p>
	Note on Using Environmental Checklist	<p>(a) If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).</p>	(a) N	<p>(a) No impacts to natural and social environment, other than above items are anticipated.</p>

Note:

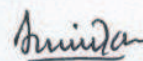
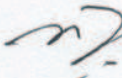
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- 1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.  
In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience)
- 2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item considering the characteristics of the project and the particular circumstances of the country and locality in which the project is located.



## Environmental Management Plan

Impact Item	Mitigation Measure	Implementing Body	Responsible Organization	Cost
<b>During Construction</b>				
Air Pollution	<ul style="list-style-type: none"> <li>• Sprinkling water.</li> <li>• To use low emission gas models of construction machines.</li> </ul>	Contractor	NWSC	Included in construction cost
Water Pollution	<ul style="list-style-type: none"> <li>• To discharge water after collection by gutters and catch basins of suspended solid.</li> </ul>	Contractor	NWSC	Included in construction cost
Noise and vibrations	<ul style="list-style-type: none"> <li>• To install soundproof walls.</li> <li>• To use low noise and vibration models of construction machines.</li> </ul>	Contractor	NWSC	Included in construction cost
Accidents	<ul style="list-style-type: none"> <li>• To wear safety protector such as gloves, helmet, safety belt, etc.</li> <li>• To implement safety management meeting.</li> </ul>	Contractor	NWSC	Included in construction cost
Existing social infrastructure and social services	<ul style="list-style-type: none"> <li>• To provide adequate operation schedule of construction vehicles.</li> </ul>	Contractor	NWSC	Included in construction cost
<b>During Operation</b>				
Water pollution	<ul style="list-style-type: none"> <li>• To discharge effluent from PS after the settlement of suspended solids</li> </ul>	Contractor for operation & maintenance (NWSC)	NWSC	Included in operation & management cost
Ground subsidence and Groundwater	<ul style="list-style-type: none"> <li>• To measure groundwater level, to manage the amount of groundwater pumping</li> </ul>	Contractor for operation & maintenance (NWSC)	NWSC	Included in operation & management cost

## Environmental and Social Monitoring Form

**(1) Responses/Actions to Comments and Guidance from Government Authorities and the Public**

Monitoring Item	Remarks
Responses/Actions to Comments and Guidance from Government Authorities	-

**(2) Mitigation Measures**

## 1) Water quality (Wastewater measured value) : During Construction/During Operation

Item (Unit)	Measured Value (Mean)	Measured Value (Maximum)	Local Standard	Japanese Standard	Remarks (Measurement point, frequency, method)
TSS (mg/L)			600	200	1 time per week before discharge into river

## 2) Groundwater level: During Operation

Monitoring Item	Remarks
Groundwater level	Once a month Test pit for the Survey

**(2) Social Environment**

## 1) Impact to existing road: During Construction

Monitoring Item	Remarks
Conditions of construction vehicles operation and traffic jams	-
Noise (under 63dB during daytime)	

## 2) Labor environment: During Construction/During Operation

Monitoring Item	Remarks
<ul style="list-style-type: none"> <li>• Labor accidents</li> <li>• Safety Protector</li> <li>• Safety Meeting</li> </ul>	-

## 資料-5 ソフトコンポーネント計画書





ネパール国  
ビラトナガル上水道改善計画準備調査

ソフトコンポーネント計画書

令和3年9月  
(2021年)

独立法人国際協力機構  
(JICA)  
八千代エンジニアリング株式会社  
株式会社 TEC インターナショナル

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## 1. ソフトコンポーネントを計画する背景

ネパール国ビラトナガル上水道改善計画（以下、本プロジェクトという）では、ビラトナガル市に必要な水道改善を実施するため、2027年を目標年次とした水道計画を策定している。

本プロジェクトでは、既存ポンプ場の改良（井戸、浄水施設（鉄・マンガン除去施設）、浄水池/ポンプ棟）、新設ポンプ場の築造（井戸、浄水施設（鉄・マンガン除去施設）、浄水池/ポンプ棟、高架タンク）、配水管の更新/整備、および水質分析機器等の調達を実施することにより、給水エリア・給水水質・給水頻度の上水道サービスの改善および、ネパール上水道公社（Nepal Water Supply Cooperation、以下 NWSC という）ビラトナガル支所の事業体制改善を図り、ビラトナガル市民の生活環境改善に寄与することを目的としている。

### (1) 現状

現在、基幹サービスを担う NWSC では、以下のような技術的問題を抱えている。

#### ① 給水水質

ほとんどの井戸原水から、基準値を上回る濃度の鉄・マンガンが検出されているが、基本的な水質項目の日常管理は行われていない。水道蛇口においては、残留塩素が検出されておらず、注入塩素濃度の管理が不十分である。また、現況の一部システムでは、井戸用水中ポンプから除鉄・除マンガン設備を通して、高架タンクに送水している。鉄・マンガン除去設備は圧力タンクを使用しているため、日常的に除鉄・除マンガン装置の個別の状態を確認できない。

#### ② 井戸揚水量・配水量管理

NWSC のすべてのポンプ場において、地下水位観測用の井戸はなく、井戸ポンプ停止時の静水位および揚水時の動水位はモニタリングされていない。また、NWSC では毎日 11 時間の計画配水が実施されているが、各井戸ポンプの流量計測および配水量の管理が不十分である。配水ネットワークの管網図は存在せず、職員の経験に基づいて、管路の位置を割り出し、管路の修繕が行われている。水道料金は従量制を基本とするが、水道メータの破損や不備が 25%程度あり、請求金額は推定値で管理されている。

### (2) ソフトコンポーネントの必要性

本プロジェクトにより水道施設（井戸、浄水施設、浄水池、高架タンク、管理棟、配水管）が全面的に計画される。本プロジェクトの概要を以下に示す。

表 1 プロジェクトの概要

	項目	事業内容
既設ポンプ場 改良および配 水管整備	井戸	3箇所 (1,200L/min) x 3 ポンプ場
	浄水施設	1箇所 (1,200L/min) x 3 ポンプ場
	浄水池/ポンプ棟	1箇所 (1,200 m <sup>3</sup> ) x 3 ポンプ場 揚水ポンプ/塩素注入施設/電気設備：一式 x 3 ポンプ場
	高架水槽	既設高架タンク活用
	配水管 (本管・支管)	φ3 -12 inch, 管延長 66.8 km
新設ポンプ場 築造および配 水管整備	井戸	3箇所 (1,200L/min) x 1 ポンプ場
	浄水施設	1箇所 (1,200L/min) x 1 ポンプ場
	浄水池/ポンプ棟	1箇所 (450 m <sup>3</sup> ) x 1 ポンプ場 揚水ポンプ/塩素注入施設/電気設備：一式 x 1 ポンプ場
	高架タンク	1箇所 (1,200 m <sup>3</sup> ) x 1 ポンプ場
	配水管 (本管・支管)	φ1.5 -10 inch, 管延長 30.3 km
資機材調達	水質分析機器	一式
	小型掘削機	2台
ソフトコンポーネント (S/C)		-浄水施設 (鉄・マンガン除去施設) ならびに 塩素注入に係る運転・維持管理 -配水システムの運転・維持管理
実施設計・施工監理		一式

既存の鉄・マンガン除去設備では、鉄・マンガンが十分に除去されていない。鉄・マンガン除去設備の運用には、塩素注入の管理が重要となるため、鉄・マンガン除去プロセスの理解を深めるとともに、塩素注入および残塩濃度の管理に係る指導が求められる。さらに、本プロジェクトでは、ろ過後に浄水池を設置する方法を採用するが、NWSC ビラトナガル支所としては初めて導入するシステムであるため、井戸ポンプおよび揚水ポンプの運転維持管理に運転・維持管理に関する技術指導が求められる。

また、水源である井戸の水量管理は、地下水位の適正な揚水管理を実施するために必要であり、これらの技術指導を実施する。本プロジェクトで配水管網やシステムは整備されるものの、各配水区での初期段階や保守段階における管理方法ならびに各配水区の配水量を適切に管理し均等に配水することが求められる。

## 2. ソフトコンポーネントの目標

本プロジェクトで整備される設備・機器が、引渡し後も NWSC のスタッフによりマニュアルに従って継続的に運転・維持管理できることにより、ビラトナガル市民へ安全な水を提

供することを支援する。

### 3. ソフトコンポーネントの成果

ソフトコンポーネントでは、「水質管理」と「配水管理」の2つの柱とし、下記の成果を期待する。

- 成果-1 :適切な水質管理を行い、良質な水を継続的に生産することが出来る様になる。
- 成果-2 :井戸及び給水システム全体の送配水量を適切に管理し、収集データを施設運転に活用することが出来る。

### 4. 成果達成度の評価方法

ソフトコンポーネントの成果は、表 2 に示す評価達成度を基に確認する。技術研修指導者は講義内容に対する試験及び質問への回答で、研修生の知識と技術の理解度を評価する。

表 2 ソフトコンポーネントの成果と達成度の確認方法

成果	達成度の確認方法
成果 1 適切な水質管理を行い、良質な水を継続的に生産することが出来る。	講義内容に対する試験及び質問への回答で理解度を確認する。 <ul style="list-style-type: none"> <li>・マニュアルに従い、次亜塩素酸カルシウムの適切な希釈方法および濃度の計算、溶液の注入量計算が正確に出来るか。</li> <li>・鉄・マンガン除去処理の原理を理解し、マニュアルに従い、処理に必要な塩素注入率を管理できているか。</li> <li>・マニュアルに従い、原水および処理水質を水質計器で適切に測定し、運転記録様式に正確に記録し、グラフ等で整理できるか。</li> <li>・マニュアルに従い、日常点検ができるか。</li> <li>・管理者は、管理者用のチェックリストに基づき、オペレーターの作業状況および施設状況を把握できるか。</li> </ul>
成果 2 井戸及び給水システム全体の送配水量を適切に管理し、収集データを施設運転に活用することが出来る。	講義内容に対する試験及び質問への回答で理解度を確認する。 <ul style="list-style-type: none"> <li>・マニュアルに従い、原水および処理水の水量及び水位を測定し、運転記録様式に正確に記録し、グラフ等で整理できるか。</li> <li>・上記データをもとに配水状況は把握できるか。</li> <li>・マニュアルに従い、日常点検ができるか。</li> <li>・管理者は、管理者用のチェックリストに基づき、オペレーターの作業状況および施設状況を把握できるか。</li> </ul>

### 5. ソフトコンポーネントの活動（投入計画）

ソフトコンポーネントは、上水道コンサルタント技術者（本邦コンサルタント：水質管理、配水システム）2 名による直接支援型とし、その期間は双方に対し現地作業 1.5 ヶ月とし、2つの成果に対する指導は、基本的に並行して実施する。このため、本邦コンサルタントの

現地作業支援のため、通訳・翻訳者1名を1.5ヶ月雇用する。

ソフトコンポーネントの開始時期は、1つのポンプ場で全体試運転が完了してから行う。試運転は、4つのポンプ場で順次行われ、各ポンプ場では、マンガン砂の活性化を行いながら、薬液注入設備や機械電気の試運転を得て、全体運転を行う。業者は試運転を通じ、機器の取り扱いの初歩的な実地訓練（OJT：On the Job Training）を並行して行う。全体運転まで含めて1つのポンプ場で約2週間の試運転を要し、全体では約2か月必要である。ソフトコンポーネントは、1つのポンプ場で全体運転が完了した後に開始することで、業者のOJTの補完、またOJTとの連携が可能となる。

試運転及びOJT内容	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
ろ材活性化																				
塩素注入試運転及びOJT																				
ろ過施設運転・洗浄方法及びOJT																				
電気設備（自動運転制御）及びOJT																				
全体運転																				

ソフトコンポーネント開始

図-1 1ポンプ場における試運転の概略工程およびソフトコンポーネントの開始時期

ソフトコンポーネントは、座学と実習により実施する。現地では、予め計画した研修計画について、NWSCと協議し、研修内容と研修工程を確認する。はじめに、各施設の状態把握、NWSCスタッフへのOJTの内容等を確認し、運転維持管理マニュアルを整備する。

その後、整備したマニュアルを使用し座学による研修を行う。マニュアルは、運転方法の他、浄水プロセスの原理、水質や水量の記録様式、管理者用のチェックリストを含め整備する。次に、実際にマニュアルや記録様式に基づいて、現場での実習を行う。現場研修は対象となる4つの施設に対して平等に行う事で、施設間の運転維持管理レベルにばらつきが生じない様に留意する。現状とそぐわない場合は、これらを準備アップデートし、NWSCが継続的に使用しやすいものに変更する。実習後は、座学や実習で行った内容について、試験や質問を行い、研修生の理解度を評価する。試験は、確認用チェックシートを使って行う。なお、研修は支所長等の管理職を含めるが、通常勤務と並行して行うため、すべての訓練に参加できない可能性がある。このため、週間打合せを開催する等、進捗の確認や課題などを共有する機会を設ける。

実際の運転管理は、水質と水量を同時に管理する必要があり、ソフトコンポーネントでも、合わせて学習する意義は大きい。水質管理と配水管理で共通する部分は、同時に座学や実習を行うなどして、双方補完する。

英語でのコミュニケーションは難しく、通訳を必要とするが、上記のように同時に実施することも可能なため、通訳は1名の配置とする。マニュアルの翻訳も必要であり、日本人と同じ期間の配置とする。ソフトコンポーネントの活動計画を表3に示す。なお、詳細工程は、後述する。

表 3 ソフトコンポーネントの概要

成果	必要とされる技術・業種	必要とされる技術レベル/ 施設・資材	活動内容及び研修項目	必要な投入量
<p><b>成果 1</b></p> <p>適切な水質管理を行い、良質な水を継続的に生産することが出来る。</p>	<p><b>技術：</b></p> <ul style="list-style-type: none"> <li>- 浄水処理、水質、運転、維持管理</li> </ul> <p><b>業種：</b></p> <ul style="list-style-type: none"> <li>- 浄水プロセス、水質管理</li> </ul>	<p>- 各施設の機能の理解と運転維持管理方法を習得する必要がある。</p> <p>- 水質測定機器の使用法を理解し、適切な水質管理を習得する必要がある。</p> <p><b>施設・資材</b></p> <p>鉄・マンガン除去施設、配水池、水質分析機器</p>	<p><b>(座学)：マニュアルを活用した座学を行う。</b></p> <ul style="list-style-type: none"> <li>- 原水水質と浄水プロセスの理解</li> <li>- 各施設の機能の理解、及び運転維持管理方法</li> <li>- 水質分析機器の使用法の理解</li> </ul> <p><b>(実習)：施設を活用した実習および実習を通じたマニュアルの改訂を行う。</b></p> <ul style="list-style-type: none"> <li>- 塩素注入施設の操作</li> <li>- 鉄・マンガン除去施設の運転・維持管理方法習得</li> <li>- 水質測定機器の操作</li> <li>- 水質試験の記録と分析</li> </ul> <p><b>(対象)：Manager/Operator 他計 5 名</b></p>	<ul style="list-style-type: none"> <li>-水質管理技術者（日本人コンサルタント）企画/準備/報告書/実施：水質管理:1名 x 1.5ヶ月</li> <li>-現地通訳・翻訳者:1名 x 1.5ヶ月（活動2と兼用）</li> </ul>
<p><b>成果 2</b></p> <p>井戸及び給水システム全体の送配水量を適切に管理し、収集データを施設運転に活用することが出来る</p>	<p><b>技術：</b></p> <ul style="list-style-type: none"> <li>- 配水管理、運転、維持管理</li> </ul> <p><b>業種：</b></p> <ul style="list-style-type: none"> <li>- 配水システム</li> </ul>	<ul style="list-style-type: none"> <li>- 水量・水位のモニタリング手法を理解し、記録データを施設運転に活用する方法を習得する必要がある。</li> <li>- 配水システムの構造・機能を理解し、効率的な配水方法を習得する必要がある。</li> </ul> <p><b>施設・資材</b></p> <p>ポンプ場、流量計 配水ネットワーク、給水管</p>	<p><b>(座学)：マニュアルを活用した座学を行う。</b></p> <ul style="list-style-type: none"> <li>- 地下水揚水量及び配水量のモニタリング手法の理解</li> <li>- 地下水位、配水施設の水位のモニタリング手法の理解</li> <li>- 配水システムの機能の理解、及び運転維持管理方法</li> </ul> <p><b>(実習)：施設を活用した実習および実習を通じたマニュアルの改訂を行う。</b></p> <ul style="list-style-type: none"> <li>- 各施設の水量測定・水位測定と記録</li> <li>- データ分析と配水状況の把握</li> <li>- 配水ネットワークと顧客データの記録</li> </ul> <p><b>(対象)：Manager/Operator 他計 5 名</b></p>	<ul style="list-style-type: none"> <li>-配水システム技術者（日本人コンサルタント）</li> <li>企画/準備/報告書/実施：配水システム:1名 x 1.5ヶ月</li> <li>-現地通訳・翻訳者:1名 x 1.5ヶ月（活動1と兼用）</li> </ul>

## 6. ソフトコンポーネントの実施リソースの調達方法

本ソフトコンポーネントでは、新設/更新する送配水管から、新設する浄水施設・浄水池・高架タンクにいたる浄水/送配水システム全体の運転・維持管理に係る知識・技術の移転を行う。従って担当する技術者は、本プロジェクトの計画・設計に従事し、送配水システム全体に精通した技術者である必要があることから、本邦コンサルタント（2名）による直接支援者にて実施する。但し、本邦コンサルタント支援のため、通訳・翻訳者を雇用する。



## 7. ソフトコンポーネントの実施工程

本プロジェクトの全体事業実施工程を表 4 に示す。

表 4 全体事業実施工程

項目	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34		
実施設計	★(EN) (現地調査)																																			
施設建設																																				
ソフトコンポーネント																																				

ソフトコンポーネントの実施にあたっては、研修計画を作成することにより、具体的な実施工程、研修手順を決定する。両ソフトコンポーネントは、施設が稼働開始する試運転が開始されてからとなり、事業決定後 33 カ月目、工事開始から 23 ヶ月目からの実施とする。表 5 にソフトコンポーネントの全体実施工程と表 6 に詳細の活動を示す。

表 5 ソフトコンポーネント全体実施工程

実施工程	28	29	30	31	32	33	34
工事工程	18	19	20	21	22	23	24
建設工事							
試運転							
引渡し							★
支援活動-1 鉄・マンガン除去施設ならびに 塩素注入に係る運転・維持管理	水質 管理						
支援活動-2 配水システムの運転・維持管理	配水 シス テム						
報告書提出						研修マ ニユ アル▲	報告 書▲

出典：JICA 調査団



## 8. ソフトコンポーネントの成果品

本ソフトコンポーネントにおける成果品、および提出時期を表7に示す。

表7 成果品一覧

分類	成果品	内容	提出時期	頁数
マニュアル	浄水施設運転・維持管理マニュアル (英語5部、ネパール語5部)	<ul style="list-style-type: none"> <li>- 浄水プロセスの機能</li> <li>- 施設ごとの運転方法</li> <li>- 水質測定方法</li> <li>- 運転記録様式/管理台帳</li> <li>- 管理チェックリスト</li> </ul>	事業開始後 33ヶ月	20
	配水システム維持管理マニュアル (英語5部、ネパール語5部)	<ul style="list-style-type: none"> <li>- 配水システムの機能</li> <li>- 流量観測・水位観測・記録方法</li> <li>- 運転記録様式/管理台帳</li> <li>- データ分析とその活用方法</li> <li>- 管理チェックリスト</li> </ul>	事業開始後 33ヶ月	20
報告書	ソフコン完了報告書 (ネパール・日本側に提出)	<ul style="list-style-type: none"> <li>- 活動計画と実績</li> <li>- 活動・成果の達成度</li> <li>- 成果の達成度に影響を与えた要因</li> <li>- 成果の持続・発展のための今後の課題・提言等</li> <li>- 各種マニュアル一式</li> </ul>	事業開始後 34ヶ月	30

## 9. ソフトコンポーネントの概算事業費

本ソフトコンポーネントの概算事業費は、約 12,190 千円である。その内訳を表 8 に示す。

表 8 ソフトコンポーネントの概略事業費

項目	金額 (千円)	備考
(1) 直接人件費	3,072	(a)
(2) 直接経費	2,482	(b) = 1)~6)の合計
1) 現地傭人費	271	ローカルコンサルタント、通訳、翻訳
2) 旅費	399	
3) 日当	331	
4) 宿泊費	967	
5) 車両費	514	
6) その他	0	教材費等
(3) 間接費	6,390	(c) = 1) + 2)
1) その他原価	3,686	
2) 一般管理費	2,704	
合計	11,944	(d) = (a) + (b) + (c)

## 10. 相手国実施機関の責務

ソフトコンポーネントの実施に関して、NWSC 側の責務は以下の通りである。

- ◆ ソフトコンポーネントに必要な人員、講習施設及び資材を確保する。
- ◆ ソフトコンポーネントの活動時に必要な人件費、講習施設及び資材を確保する。
- ◆ ソフトコンポーネント完了後も、活動の継続に必要な人員、資材等を確保する。

一方、雇用する NWSC ビラトナガル支所の職員は限定的でもあることから、通常業務の阻害にならないような配慮は必要である。ビラトナガル支所の現時点での職員数は、正規と契約を合わせて合計 40 名である。支援対象となりうる現状の職員の構成は、表 9 に示す。NWSC は、不足する職員については、新たに雇用する計画としているため、本ソフトコンポーネントに必要な所員は、各支援に対して 5 名から 10 名程度の人員を想定する。

表 9 ソフトコンポーネント支援対象と現状の職員数

ポスト	正規職員	有期契約	支援対象	
			支援活動 1	支援活動 2
Engineer (Civil)	2	0	○	○
Plumper	0	1		○
Supervisor/ Mechanics (Electro-mechanical)	2		○	
Pump Operator	4	1	○	○
Meter Reader	2	6		○
Accountant/Administration	4	8		△
Others	4	6		
合計	18	22		

