

資料一 1 調査団員・氏名

調査団員名簿

1. 基本設計調査時

氏名	担当業務	現職
千原 大海	総括	国際協力事業団 国際協力専門員
松井 義雄	技術参与	名古屋市環境科学研究所 水質部 主任研究員
笠原 健一郎	計画管理	国際協力事業団 経理部 財務第一課
佐伯 昇	業務主任/ 環境モニタリング	八千代エンジニアリング株式会社
武内 正博	機材計画 I	八千代エンジニアリング株式会社
鶴巻 峰夫	機材計画 II	八千代エンジニアリング株式会社
岡崎 良弘	ネットワークシステム計画	八千代エンジニアリング株式会社
清水 清	積算/調達管理計画	八千代エンジニアリング株式会社

2. 事業化調査時

氏名	担当業務	現職
岩切 敏	総括	外務省 経済協力局 無償資金協力課 審査官
大竹 茂	計画管理	国際協力事業団 無償資金協力部 業務第一課
武内 正博	業務主任/ 環境モニタリング	八千代エンジニアリング株式会社
清水 清	積算/調達管理計画	八千代エンジニアリング株式会社
鶴巻 峰夫	施設設計	八千代エンジニアリング株式会社

資料一2 調査行程

調査行程表

1. 基本設計調査

No.	月/日	曜日	天候	宿泊地	移動	調査業務の内容
1	'99 11/15	月	晴	パリ アブダビ	官団員 コンサル団員	官団員（千原、松井、笠原）移動 成田発AF275（12:35）→パリ着（17:10） コンサル団員（佐伯、武内、鶴巻、岡崎）移動 成田発CX501（10:35）→香港CX731（14:45/16:30） →ドバイ着（21:15）
2	11/16	火	晴	アンマン	官団員 コンサル団員	官団員（千原、松井、笠原）アンマン着 パリ発AF672（13:15）→アンマン着（19:15） コンサル団員（佐伯、武内、鶴巻、岡崎）アンマン着 ドバイ発RJ191（8:30）→アンマン着（9:15） 団内会議
3	11/17	水	晴	アンマン		JICA事務所表敬 大使館表敬 計画省表敬、インセプション・レポート（IC/R）説明・協議 HCST表敬、IC/R説明・協議
4	11/18	木	晴	アンマン		サイト調査（ムハイバ水源、ヤムク川分岐部、ルウェー援助 の水質監視所、キング・アブドゥラ運河、ワジアラブ貯水池、 JVA Lab、ディール水制御センター、ザイ浄水場）
5	11/19	金	晴	アンマン		団内会議 資料整理
6	11/20	土	晴	アンマン		ERC Lab表敬・協議 水・灌漑省表敬・協議 WAJ表敬・協議 JVA表敬・協議 RSS表敬・協議 HCST表敬・協議
7	11/21	日	晴	アンマン		[松井、笠原、武内、鶴巻、岡崎] WAJ Lab表敬・協議 キング・タール貯水池調査 アッサム下水処理場調査 [千原団長、佐伯] USAID表敬・協議
8	11/22	月	晴	アンマン		[千原団長、松井、笠原、佐伯] HCSTとミニッツ協議 [武内、鶴巻、岡崎] ジョルダン川調査 ディール水制御センター調査
9	11/23	火	晴	アンマン		ミニッツ調印 JICA事務所報告 大使館報告
10	11/24	水	晴	アンマン	官団員	[官団員（千原、松井、笠原）ジョルダン発] アンマン発AF677（7:20）→パリ着（11:50） パリ発JL406（17:55） [コンサル団員継続調査] ディール水制御センターと技術協議（流量データ） JVA Labと技術協議（質問票）

No.	月/日	曜日	天候	宿泊地	移動	調査業務の内容
11	11/25	木	晴	アンマン	官団員	[官団員 (千原、松井、笠原) 日本着 (13:45)] モニタリング地点踏査 (ジョルダン川 2 地点) WAJ Labと技術協議 (質問票)
12	11/26	金	曇り	アンマン		資料整理・分析 団内会議
13	11/27	土	曇り 一時 雨	アンマン		モニタリング地点踏査 (キングタール貯水池 2 地点) HCSTと技術協議 ERCと技術協議
14	11/28	日	雨 のち 晴	アンマン		ザイ浄水場調査 他援助国プロジェクト調査 HCSTと技術協議 (質問票) モニタリング地点踏査 (キングアブドラ運河 1 地点、 ザイ浄水場取水側 1 地点)
15	11/29	月	晴	アンマン		HCSTと技術協議 ERCと技術協議 JICA事務所中間報告
16	11/30	火	晴	アンマン	コンサル団員	モニタリング地点踏査 (カラメ貯水池下流側地点) [コンサル・清水団員日本発] 成田発CX501 (10:35) →香港CX733 (14:45/16:30) →ドバイ着 (0:20)
17	12/1	水	晴	アンマン	コンサル団員	[コンサル・清水団員ジョルダン着] ドバイ発EK903 (6:30) →アンマン着 (07:55) JVA計画プロジェクト部と技術協議 モニタリング地点踏査 (アッハム下水処理場下流側 1 地点) JVA Labから質問票への回答入手
18	12/2	木	晴	アンマン		WAJ Labと技術協議 (質問票への回答) 調査結果の整理・解析 調達関連調査 (代理店、輸送業者等)
19	12/3	金	晴	アンマン	コンサル団員	[コンサル・鶴巻団員ジョルダン発] アンマン発GA972 (14:10) →ハーレーン着 (17:30) → ハーレーン発CX730 (23:35) → 資料整理・分析、団内会議
20	12/4	土	晴	アンマン	コンサル団員	[コンサル・鶴巻団員日本着] 香港着 (12:05) →香港発CX500 (15:15) → 成田着 (20:00) WAJ Labと技術協議 (質問票) HCSTと技術協議 (モニタリング計画) JTCと技術協議 (テレメトリー関係データ収集) 調達関連調査 (代理店、輸送業者等)
21	12/5	日	晴	アンマン		JVA Labと技術協議 (質問票) HCSTと技術協議 (テレメトリー関係) モニタリング地点踏査 調達関連調査 (代理店、輸送業者等) フィールドレポート (FL/R) 作成
22	12/6	月	晴	アンマン		HCSTと技術協議 (モニタリング計画) ハシェミテ大学 (環境基準) 調達関連調査 (代理店、輸送業者等) FL/R作成

No.	月/日	曜日	天候	宿泊地	移動	調査業務の内容
23	12/7	火	晴	アンマン		ERCと技術協議（質問票） HCSTと技術協議（質問票） FL/R作成 調達関連調査（代理店、輸送業者等）
24	12/8	水	晴	アンマン		モニタリング地点調査（関係機関による確認） FL/R作成 調達関連調査（代理店、輸送業者等）
25	12/9	木	晴	アンマン	コンサル団員	[コンサル・岡崎団員ジ'オルダン発] アンマン発GF972（14:30）→ハ'ーレン着（19:45）→ ハ'ーレン発CX730（23:35）→ FL/R作成 調達関連調査（代理店、輸送業者等）
26	12/10	金	晴	アンマン	コンサル団員	[コンサル・岡崎団員日本着] 香港着（12:05）→香港発CX500（15:15）→ 成田着（20:00） FL/R作成
27	12/11	土	晴	アンマン		モニタリング地点調査（関係機関による確認） FL/R作成 調達関連調査（代理店、輸送業者等）
28	12/12	日	晴	アンマン		HCSTにFL/R提出、関係機関と協議 GCEPと協議 調達関連調査（代理店、輸送業者等）
29	12/13	月	晴	アンマン		関係機関とFL/R協議 ERCと協議 調達関連調査（代理店、輸送業者等）
30	12/14	火	晴	アンマン		関係機関とFL/R協議 JVA Labと協議 ザイ浄水場調査（テレメトリ関係） 調達関連調査（代理店、輸送業者等）
31	12/15	水	晴	アンマン		関係機関とFL/R協議 HCSTと協議 大使館に報告
32	12/16	木	晴	アンマン		JICAに報告 ザイ浄水場補足調査（ルウェーコンサルと技術協議） 調達関連調査（代理店、輸送業者等）
33	12/17	金	晴	アンマン		資料整理、入手データの解析 団内会議
34	12/18	土	晴	機中	コンサル団員	FL/R最終協議 [コンサル団員（佐伯、武内、清水）ジ'オルダン発] アンマン発EK904（16:30）→ド'バイ着（21:15）→ ド'バイ発CX750（23:55）→
35	12/19	日	晴		コンサル団員	[コンサル団員（佐伯、武内、清水）日本着] 香港着（15:15）→香港発CX508（16:20）→ 成田着（21:05）

注) HCST : Higher Council for Science and Technology
GCEP : General Corporation for Environmental Protection
RSS : Royal Scientific Society
ERC : Environment Research Center
JVA : Jordan Valley Authority
WAJ : Water Authority of Jordan

2. 事業化調査(現況確認補足調査)

No.	月/日	曜日	天候	宿泊地	移動	調査業務の内容
1	'02 1/4	金	晴	パリ	コンサル団員	[コンサル団員(武内、清水、鶴巻)日本発] 成田発JL405(11:10)→パリ(15:40)
2	1/5	土	晴	アンマン	コンサル団員	[コンサル団員(武内、清水、鶴巻)ジョルダン着] パリ発RJ116(15:30)→アンマン着(23:10)
3	1/6	日	晴	アンマン		HCST表敬、インセプション・レポート(IC/R)説明 JICA事務所表敬、対処方針説明 再委託調査(測量)
4	1/7	月	曇り のち 雪	アンマン		JVA試験所調査 モニタリングステーション予定地No.1、2、3、12調査 再委託調査(測量)
5	1/8	火	雨 のち 曇り	アンマン		HCSTとミニッツ案協議 建設事情調査 再委託調査(測量)
6	1/9	水	雨	アンマン		ザイ浄水場の早期警告システムの現状調査 ディラール流量管理センターと協議 (データ提供方法の確認) JVA試験所 DFR説明、要請機材確認 モニタリングステーション予定地No.7、13調査 再委託調査(測量)
7	1/10	木	晴	アンマン		HCSTと協議(データ準備確認) モニタリングステーション予定地No.8～11調査 建設事情調査 再委託調査(測量)
8	1/11	金	曇り	アンマン		モニタリングステーションNo.10調査 資料整理・分析
9	1/12	土	雨	アンマン		モニタリングステーションNo.7、13調査 HCSTと協議 建設事情調査 再委託調査(測量)
10	1/13	日	雨	アンマン		GCEPと協議 ERCと協議、DF/R説明 WAJ試験所と協議、DF/R説明 WAJ試験所の新設建屋調査 モニタリング・センター予定地調査 再委託調査(測量)
11	1/14	月	晴	アンマン		HCSTとミニッツ案協議 再委託調査(測量) 建設事情調査
12	1/15	火	曇り	アンマン		電力事情調査 通信施設の現況調査 モニタリングステーション予定地No.10調査 HCSTと協議 再委託調査(測量)
13	1/16	水	晴	アンマン		JICA事務所へ中間報告 フィールド・レポート(FL/R)作成 再委託調査(測量)

No.	月/日	曜日	天候	宿泊地	移動	調査業務の内容
14	1/17	木	晴	アンマン	コンサル団員	[コンサル・鶴巻団員移動シヨルダン発] アンマン発 RJ111 (11:15)→ロンドン着 (14:45) ロンドン発 JL402 (19:00) FL/R作成 HCSTとDF/R協議 電力・通信事情調査 再委託調査(測量)
15	1/18	金	晴	アンマン	コンサル団員	[コンサル・鶴巻団員日本着] FL/R作成 再委託調査(測量)
16	1/19	土	晴	アンマン		FL/R作成 電力・通信事情調査 再委託調査(測量)
17	1/20	日	晴	アンマン	官団員	[官団員(岩切団長、大竹)日本発] 成田発JL405 (11:10)→パリ着 (15:40) 電力・通信事情調査 モニタリングステーション予定地No.8 & 9調査 FL/R作成 再委託調査(測量)
18	1/21	月	晴	アンマン	官団員	[官団員(岩切団長、大竹)アンマン着] パリ発AF672 (19:15)→アンマン着 (19:15) FL/R作成 団内会議
19	1/22	火	晴	アンマン		JICA事務所と協議 在シヨルダン日本大使館表敬 GCEP、WAJ、JVA、MWI表敬 団内会議
20	1/23	水	晴	アンマン		HCSTとミニッツ協議 HCSTとFL/R協議 WAJ試験所と協議
21	1/24	木	晴	アンマン		ミニッツ調印 計画省表敬 JICA事務所報告 在シヨルダン日本大使館表敬
22	1/25	金	晴	機中	官団員 コンサル団員	[官団員(岩切団長、大竹)、コンサル団員(武内、清水) シヨルダン発] アンマン発AF677 (07:15)→パリ着 (11:50) パリ発JL406 (18:05)→
23	1/26	土	晴		官団員 コンサル団員	[官団員(岩切団長、大竹)、コンサル団員(武内、清水) 日本着] 成田着(13:55)

注) HCST : Higher Council for Science and Technology
GCEP : General Corporation for Environmental Protection
RSS : Royal Scientific Society
ERC : Environment Research Center
JVA : Jordan Valley Authority
WAJ : Water Authority of Jordan

資料一3 関係者(面会者)リスト

関係者(面会者)リスト

1. 基本設計調査時

関係機関・所属		氏 名
(英 文 名)	(邦 訳)	
Higher Council for Science and Technology (HCST) Secretary General Head of Agriculture and Water Sector	高等科学技術審議会 副総裁 農業・水セクター課長	Dr. Munther Al-Masri Ms. Majeda Al-Assaf
The Royal Scientific Society (RSS) Vice President	王立科学院 副院長	Dr. Seyfeddin Muaz
Environment Research Center (ERC) Director	環境研究センター 部長	Dr. Bassam Hayek Dr. Mohamed Y. Saidam
National Information Center (NIC) Manager, Communication & Network	国家情報センター 部長	Mr. Amjad Al-Ashqar
Ministry of Planning Secretary General Director of Water Environment and Tourism Dept. Director of Multilateral Cooperation Dept. Director of Information and Computer Dept.	計画省 次官 水環境・観光部長 多国間協力部長 情報コンピュータ部長	Dr. Jamal Salah Mr. Boulos Kefaya Dr. Nael T. Al-Hajaj Mr. Munir Asad
Ministry of Municipal, Rural Affairs and the Environment Minister	自治・環境省 大臣	H.E. Tawfeeq Kreishan
General Corporation for Environmental Protection (GCEP) Director General Director	環境保護公社 総裁 水質部長	Dr. Suleiman Jafari Dr. Ahmed Khattab
Ministry of Water and Irrigation Secretary General Assistant Secretary General	水・灌漑省 次官 次官補	Dr. Hazem Nasir Mr. Fayez Bataineh
Water Authority of Jordan (WAJ) [Wastewater Service Operation Section] Engineer [Central Laboratory] Director of Central Labs Assistant Director of Central Labs [Zai Water Treatment Plant] Plant Manager (Norwegian Consultant) Technical Manager Computer System Engineer	ジョルダン水公社 技師 中央実験所長 中央実験所長補佐 浄水場所長 技術部長 システム技師	Mr. A. A. Matar Mr. Zakaria Tarawneh Dr. Nawal Sunna Mr. Saad Abu Hamour Mr. Kjell O. Wesstad Mr. Oyvind Kleppan
Jordan Valley Authority (JVA) Secretary General Director of Planning and Special Projects Director of North Area Operation Office Director of Middle Area Operation Office	ジョルダン渓谷開発公社 副総裁 計画プロジェクト部長 北部地域管理事務所長 中部地域管理事務所長	Mr. Avedis Serpekian Mr. Yousef Hasan Ayadi Mr. Qais A. Owais Mr. Tayseer M. Ghezawi

関係機関・所属		氏名
(英 文 名)	(邦 訳)	
Director of South Area Operation Office Manager of Karama Dam [Diral Control Center] Head of Contral Systems Division Instrument Engineer (French Consultant) Water Control Engineer Telecommunication Engineer [JVA Laboratory] Director Head of Lab. Division	南部地域管理事務所長 カラマダム所長 ディアル流量管理センター 制御システム課長 制御担当技師 水制御技師(コンサルタント) 通信技師(コンサルタント) 実験所長 実験部長	Mr. Farook Kanan Mr. Bader Abbadi Mr. Shafiq Al Habash Mr. Said Ridhi Said Dr. Franck Sanfilippo Mr. Michel Tuillier Mr. Hussan Ebbeni Mr. Mohammed El-Imamr
Ministry of Tourism and Antiquities Secretary General/Head of Multilateral Talk for Environment	観光・考古省 次官兼環境多国間 協議代表	Dr. Alia Hatough Bouran
The University of Jordan Dean of Fuculty of Agriculture Manager, Water& Environment Research Center	ジョルダン大学 農学部長 水・環境研究所長	Dr. Muhammad Shatanawi Dr. Manar Fayyad
Hashemite University Dean of Research & Graduate Studies	ハシェミット大学 大学院研究学部長	Dr. Talal Akasheh
U. S. Agency for International Development (USAID) Mission Environment Officer	米国援助庁 環境担当官	Mr. Abdullah A. Ahmed Dr. Amal Hijazi Mr. Steve Luxton Dr. Mohamed Chebane
Jordan Telecommunication Company Deputy Director General of Operation & Maintenance Manager of Transmission Dept. North Region	ジョルダン通信会社 運営維持管理部次長 北部地域送信部長	Mr. Ahmed H. Bani Hani Mr. Ziad Ebbini
JICA専門家(JICA Expart) Environmental Monitoring Adviser Environmental Monitoring Adviser		小林 義治 横溝 敬
在ジョルダン日本国大使館 (Embassy of Japan) 特命全権大使 (Ambassador) 一等書記官 (First Secretary)		松本 紘一 田中 聖哉
JICAジョルダン事務所(JICA Jordan office) 所 長 (Resident Representative) 次 長 (Deputy Resident Representative) 担当所員 (Assistant Resident Representative) Research Coordinator Research Coordinator		矢部 義夫 蔵方 宏 岩井 雅明 Mr. Adel O. Zureikat Mr. Hani Kurudi

2. 事業化調査時

関係機関・所属		氏名
(英 文 名)	(邦 訳)	
Higher Council for Science and Technology (HCST) Secretary General Head of Agriculture and Water Sector	高等科学技術審議会 副総裁 農業・水セクター課長	Dr. Munther Al-Masri Ms. Majeda Al-Assaf
Environment Research Center (ERC) Director Head of Water Section	環境研究センター 試験室長 水質分析部長	Dr. Bassam Hayek Dr. Mohamed Y. Saidam
Ministry of Planning Minister Director of Bilateral Cooperation Dept.	計画省 大臣 二国間協力部長	Dr. Bassam Awadallar Dr. Mustafa Al-Saleh
General Corporation for Environmental Protection (GCEP) Director General	環境保護公社 総裁	Mr. Faris Al Junaidi
Ministry of Water and Irrigation Secretary General Assistant Secretary General	水・灌漑省 次官 次官補	Dr. Hazem Nasir Mr. Fayez Bataineh
Water Authority of Jordan (WAJ) [WAJ Laboratory] Director of Central Labs Assistant Director of Central Labs [Zai Water Treatment Plant] Early Warning System Engineer	ジョルダン水公社 中央実験所長 中央実験所長補佐 早期警告システム担当技師	Mr. Zakaria Tarawneh Dr. Nawal Sunna Mrs. Majeda
Jordan Valley Authority (JVA) Secretary General Director of Planning and Special Projects [JVA Laboratory] Director Head of Lab. Division [Diral Control Center] Head of Conral Systems Division	ジョルダン渓谷開発公社 副総裁 計画プロジェクト部長 JVA試験所 実験所長 実験部長 ディアル流量管理センター 制御システム課長	Mr. Avedis Serpekian Mr. Yousef Hasan Ayadi Mr. Hussan Ebbeni Mr. Mohammed El-Imamr Mr. Shafiq Al Habash
Jordan Telecommunication Company Deputy Director General of Operation & Maintenance Manager of Transmission Dept. North Region	ジョルダン通信会社 運営維持管理部次長 北部地域送信部長	Mr. Ahmed H. Bani Hani Mr. Ziad Ebbini
在ジョルダン日本国大使館 (Embassy of Japan) 特命全権大使 参事官 二等書記官		佐々木伸太郎 吉田 潤 神谷 俊一
JICAジョルダン事務所 (JICA Jordan office) 所 長 次 長 担当所員 Research Coordinator	調整員	稲垣 瑞夫 熊谷 英範 小林 勤 Mr. Adel O. Zureikat

資料－4 当該国の社会経済状況

ジョルダン・ハシェミット王国
Hashemite Kingdom of Jordan

一般指標					
政体	立憲君主制	*1	首都	アンマン (Amman)	*2
元首	国王 / アブドラ・ビン・フセイン	*1,3	主要都市名	ザルカ、イルビド	*3
独立年月日	1946年5月25日	*3,4	労働力総計	1,398千人 (1999年)	*6
主要民族/部族名	パレスチナ人約7割、ハドゥウイン系ジョルダン人	*1,3	義務教育年数	9年間 (年)	*13
主要言語	アラビア語、英語	*1,3	初等教育就学率	70.6% (1997年)	*6
宗教	イスラム教93%、キリスト教7%	*1,3	中等教育就学率	57.4% (1997年)	*6
国連加盟年	1955年12月14日	*12	成人非識字率	10.2% (2000年)	*13
世銀加盟年	1952年8月29日	*7	人口密度	53.30人/km2 (1999年)	*6
IMF加盟年	1952年8月29日	*7	人口増加率	4.1% (1980-99年)	*6
国土面積	89.00千km2	*1,6	平均寿命	平均 70.10 男 68.90 女 71.50	*10
総人口	4,740千人 (1999年)	*6	5歳児未満死亡率	31 (1999年)	*6
			カロリー供給量	3,014.0 cal/日/人 (1997年)	*10

経済指標					
通貨単位	ジョルダン・ディナール (Dinar)	*3	貿易量	(1998年)	
為替レート	1 US \$ = 0.70 (2001年12月)	*8	商品輸出	1,802.4百万ドル	*15
会計年度	Dec. 31	*6	商品輸入	-3,403.9百万ドル	*15
国家予算	(1997年)		輸入カバー率	5.8(月) (1999年)	*14
歳入総額	1,312.6百万ディナール	*9	主要輸出品目	燐鉱石、カリ、化学肥料、医薬品	*1
歳出総額	1,681.9百万ディナール	*9	主要輸入品目	機械類、原油、食品、化学製品	*1
総合収支	-536.1百万ドル (1998年)	*15	日本への輸出	94百万ドル (2000年)	*16
ODA受取額	430.0百万ドル (1999年)	*18	日本からの輸入	132百万ドル (2000年)	*16
国内総生産(GDP)	8,072.78百万ドル (1999年)	*6			
一人当たりのGNI	1,630.0ドル (1999年)	*6	総国際準備	2,770.0百万ドル (1999年)	*6
分野別GDP	農業 2.4% (1999年)	*6	対外債務残高	8,946.9百万ドル (1999年)	*6
	鉱工業 25.6% (1999年)	*6	対外債務返済率(DSR)	11.8% (1999年)	*6
	サービス業 72.0% (1999年)	*6	インフレ率	3.9%	*6
産業別雇用	農業 男 % 女 % (1996-98年)	*6	(消費者価格物価上昇率)	(1990-99年)	
	鉱工業 % % (1996-98年)	*6			
	サービス業 % % (1996-98年)	*6	国家開発計画	IMF構造調整プログラム：1999年から3年間	*11
実質GDP成長率	5.3% (1990-99年)	*6			

気象 (1961年～1990年平均) 観測地：アンマン (北緯31度59分、東経35度59分、標高768m)														*4,5
月	1	2	3	4	5	6	7	8	9	10	11	12	平均/計	
降水量	62.8	54.3	51.3	20.8	2.8	0.1	0.0	0.0	0.0	8.6	21.1	50.5	276.3 mm	
平均気温	7.7	9.0	11.6	15.8	20.1	23.6	25.1	25.2	23.4	19.9	14.4	9.3	17.1 °C	

- *1 各国概況 (外務省)
- *2 世界の国々一覧表 (外務省)
- *3 世界年鑑2000 (共同通信社)
- *4 最新世界各国要覧10訂版 (東京書籍)
- *5 理科年表2000 (国立天文台編)
- *6 World Development Indicators2001(WB)
- *7 BRD Membership List(WB)
- IMF Members' Financial Data by Country(IMF)
- *8 Universal Currency Converter

- *9 Government Finance Statistics Yearbook1999 (IMF)
 - *10 Human Development Report2000,2001(UNDP)
 - *11 Country Profile(EIU),外務省資料等
 - *12 United Nations Member States
 - *13 Statistical Yearbook 1999(UNESCO)
 - *14 Global Development Finance2001(WB)
 - *15 International Financial Statistics Yearbook 2000(IMF)
 - *16 世界各国経済情報ファイル2001(世界経済情報サービス)
- 注：商品輸入については複式簿記の計上方式を採用しているため
支払い額はマイナス表記になる

	ジョルダン・ハシェミット王国
	Hashemite Kingdom of Jordan

項目	年度	1995	1996	1997	1998	1999
技術協力		17.36	11.02	11.50	13.87	18.03
無償資金協力		33.66	50.66	26.63	33.20	59.98
有償資金協力		286.77		122.37	71.99	90.88
総額		337.79	61.68	160.50	119.06	168.89

項目	暦年	1995	1996	1997	1998	1999
技術協力		18.72	14.13	10.53	10.41	14.26
無償資金協力		23.76	32.26	38.72	18.79	-2.95
有償資金協力		141.75	77.34	90.37	14.75	-2.95
総額		184.23	123.73	139.63	43.96	60.82

	贈与 (1) (無償資金協力・ 技術協力)	有償資金協力 (2)	政府開発援助 (ODA) (1)+(2)=(3)	その他政府資金 及び民間資金(4)	経済協力総額 (3)+(4)
二国間援助 (主要供与国)	289.4	35.9	325.3	12.5	337.8
1. United States	170.2	0.0	170.2	0.0	170.2
2. Japan	63.8	-3.0	60.8	0.9	61.7
3. Germany	27.5	31.4	58.9	-2.6	56.3
4. France	5.0	4.9	9.9	13.3	23.2
多国間援助 (主要援助機関)	101.9	3.5	105.4	66.2	171.6
1. UNRWA			83.0	0.0	83.0
2. EC			14.0	-5.8	8.2
その他			-0.7	0.0	-0.7
合計	391.3	38.7	430.0	78.7	508.7

技術協力：計画省
無償：計画省
協力隊：計画省

*17 我が国の政府開発援助2000(国際協力推進協会)

*18 International Development Statistics (CD-ROM) 2001 OECD

*19 JICA資料

資料一5 討議議事録(M/D)

**MINUTES OF DISCUSSIONS
ON
BASIC DESIGN STUDY
ON
THE PROJECT
FOR
IMPROVEMENT OF MONITORING EQUIPMENT FOR WATER POLLUTION
IN
THE HASHEMITE KINGDOM OF JORDAN**

Based on the results of the Preliminary Study, the Government of Japan decided to conduct a Basic Design Study on the Project for Improvement of Monitoring Equipment for Water Pollution (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Hashemite Kingdom of Jordan (hereinafter referred to as "Jordan") the Basic Design Study Team (hereinafter referred to as "the Team") which is headed by Mr. Hiromi Chihara, Development Specialist, JICA, and is scheduled to stay in the country from 16th of November to 18th of December, 1999.

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

In the course of the discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study report.

Amman, 23rd of November, 1999



Mr. Hiromi Chihara
Leader
Basic Design Study Team
JICA



Dr. Munther Al-Masri
Secretary General
The Higher Council for Science and
Technology

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the environmental condition by means of the introduction of monitoring system for water pollution in the Jordan Valley Area and other selected sites.

2. Project Sites

The Project sites are described in Annex-I.

3. Responsible and Implementing Agencies

- (1) The responsible and implementing agency is the Higher Council for Science and Technology (HCST).
- (2) When the National Center for Environmental Research and Monitoring (NCERM) or the equivalent entity is established under HCST, NCERM or this entity becomes the implementing agency.

4. Items Requested by the Government of Jordan

After discussions with the Team, the items described in Annex-II were finally requested by the Jordanian side. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

- (1) The Jordanian side has understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex-III.
- (2) The Jordanian side will take the necessary measures, as described in Annex-IV, for the smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the Study

- (1) The consultant members of the Team will proceed to further studies in Jordan until 18th of December 1999.
- (2) After when the requirements of the Project as stipulated in Paragraph 7.1 of this Minutes of Discussions are met to satisfaction of the Japanese side, JICA will prepare the draft report in English, and dispatch a mission in order to explain its contents.
- (3) (i) If the above-mentioned condition is fulfilled not later than the end of January 2000, JICA will dispatch the mission around March 2000.
(ii) In case that the contents of the draft report is accepted in principle by the Government of Jordan, JICA will complete the final report and send it to the Government of Jordan by May 2000.

7. Other Relevant Issues

7.1 Conditions of Project Implementation

(1) Establishment of National Center for Environmental Research and Monitoring (NCERM)

- The Team explained that the establishment of the NCERM by the legislation of By-Law of the NCERM is one of the essential conditions for implementation of the Project.
- The Jordanian side explained up-to-date situation regarding the establishment of the NCERM based on the HCST board meeting held on November 2nd, 1999 as follows;

For reasons of the overall operational efficiency of HCST organizations, the functions proposed for the NCERM can possibly be attached to the existing RSS (one of the HCST affiliated centers) instead of creating a new center. The final decision on this issue will be taken by the HCST board.

- The Team stressed that any new counterpart entity of the Project shall be lawfully qualified in such a way that the legal aspects of the organization, the role and responsibility of the Management Council and other terms and conditions envisaged for applying to the NCERM shall practically be maintained and redefined by legislative procedures.
- The Jordanian side agreed, with their appreciating the above-mentioned original intent of establishing the NCERM, to submit the institutional plan and the schedule of necessary legal procedure for establishment of the counterpart entity for the Project by the end of January 2000 or sooner.

(2) Importance of utilization of monitored data for environmental protection

The Team further explained the importance of the effective utilization of monitored data for execution of the national environmental protection policy such as by enacting legislation of anti-pollution laws and regulations and through institutional building. The Jordanian side also understood the explanation.

7.2 Technical Discussions

(1) Locations and Parameters of Continuous Monitoring

The Team explained that the locations and parameters of the continuous monitoring stations will be examined considering a common utilization of the existing and/or planned data/information by other organizations and necessity of additional data/information.

As for the monitoring stations of Aqaba, the Jordanian side emphasized the point that it is extremely important to monitor its water quality as requested in the original proposal. The Team replied that since this cooperation intends to focus on the water quality being relevant to the supply to the metropolitan area, these stations would not be considered in the Project.

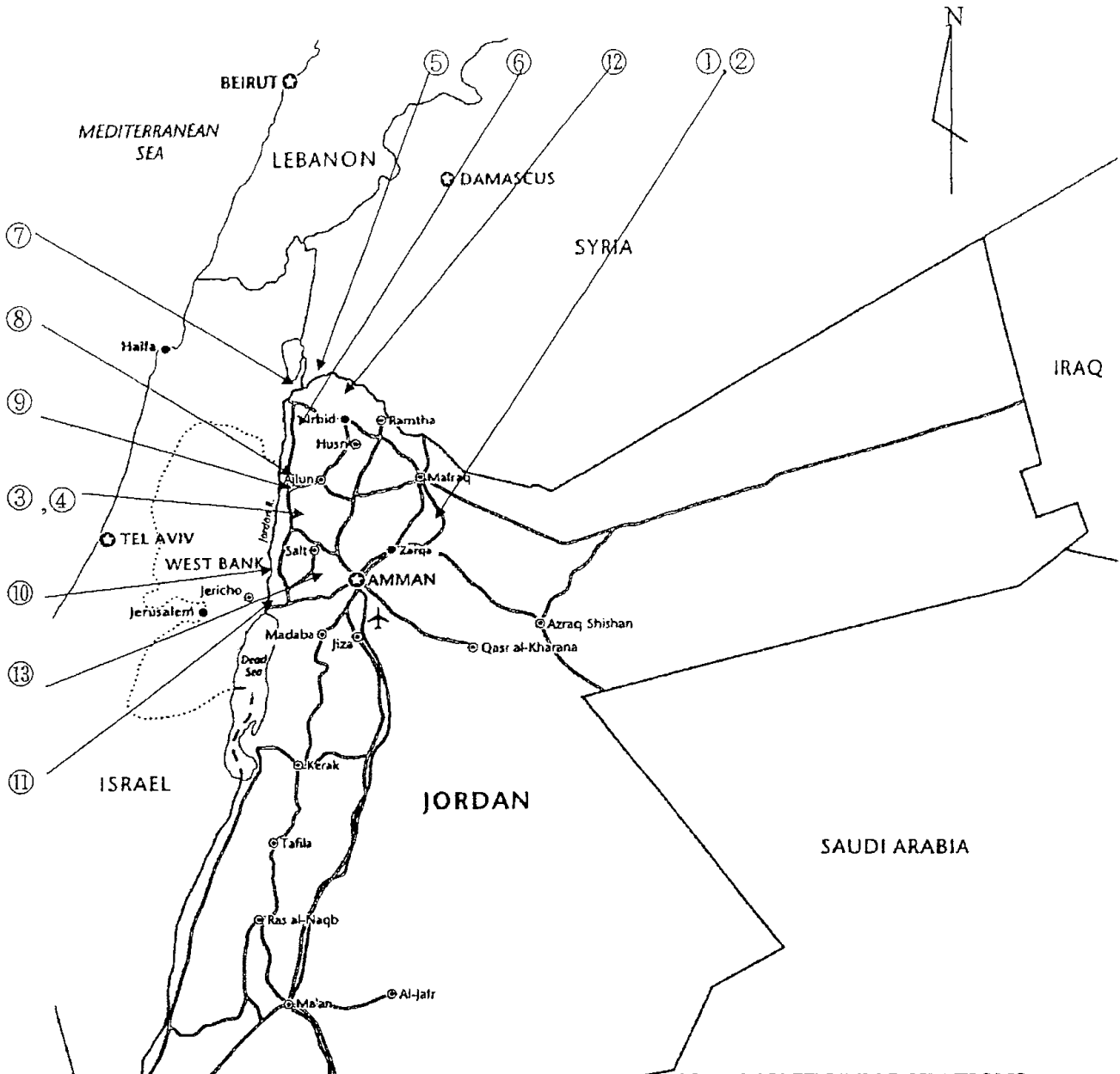
(2) Permissions/Approvals of the Authorities Concerned

The Team pointed out that the Jordanian side will take necessary actions to secure the land acquisition and preparation of the spaces/buildings for the equipment/stations and the permissions/approvals as well from the related authorities for the installation of sampling/measuring devices in the designated river/canal/channel. The Jordanian side explained that these arrangements will be finalized by the end of January 2000 and the results will be reported to JICA Headquarters in writing through JICA Jordan office.

(3) The Work to be done by the Jordanian side

Both parties confirmed that the scope of the Japanese side is to procure the equipment, while the scope of the Jordanian side is to prepare the buildings/spaces for the equipment, to construct the river/canal structures for water sampling and measurements and to install the equipment with associated civil and utility works such as electricity, water, waste disposal, air conditioning and telephone line.

Annex -I



No. MONITORING STATIONS

- ① As-Samra WSP Inlet
- ② As-Samra WSP Outlet
- ③ King Talal Reservoir Inlet
- ④ King Talal Reservoir Outlet
- ⑤ Yarmouk river Adasyia Diversion
- ⑥ Wadi Arab Dam Outlet
- ⑦ Tiberias, Degania
- ⑧ King Abdullah Canal Zai Intake
- ⑨ King Abdullah Canal Zarqa Junction
- ⑩ King Abdullah Canal Karameh Dam
- ⑪ Jordan River
- ⑫ Wadi Shalaleh Treatment Plant Outlet
- ⑬ Zai Water Treatment Outlet

Location of the Project Sites

Table-1 List of Requested Monitoring Equipment

Station No.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬
Location	As-Samra WSP Inlet	As-Samra WSP Outlet	King Talal Reservoir Inlet	King Talal Reservoir Outlet	Yarmouk River Adasyia Diversion	Wadi Arab Dam Outlet	Tiberias, Degania	King Abdullah Canal Zai Intake	King Abdullah Canal Zarqa Junction	King Abdullah Canal Karameh Dam	Jordan River	Wadi Shalaleh Treatment Plant Outlet	Zai Water Treatment Outlet
Thermometer	1	1	1	1	1	1	1	1	1	1	1	1	1
pH Meter	1	1	1	1	1	1	1	1	1	1	1	1	1
DO Meter	1	1	1	1	1	1	1	1	1	1	1	1	1
Conductivity Meter	1	1	1	1	1	1	1	1	1	1	1	1	1
TB Meter					1	1	1	1			1		1
COD Analyzer	1	1	1	1		1	1	1	1	1			1
T-N Analyzer		1		1	1	1	1	1			1	1	
T-P Analyzer		1		1	1	1	1	1			1	1	
Residual Chlorine Analyzer													1
Flow Meter		1	1	1	1	1	1				1	1	1
Sampling Unit		1		1	1	1					1	1	1

A5-6






Table-2 List of Requested Laboratory Equipment

1. WAJ Labs

- (1) Analytical Chemistry Div./ Organic Lab
- (2) Analytical Chemistry Div./ Inorganic and Hydro Chemistry Lab
- (3) Analytical Chemistry Div./ Inorganic Heavy Metals lab
- (4) Wastewater Chemistry Div.
- (5) Water Quality Monitoring Div.
- (6) Microbiology Lab

No.	Equipment	Purpose	Number
W-(1)-1	HPLC	For the analysis of high molecular weight organic compounds	1
W-(2)-1	Flame Photometer	For the analysis of Na, K, Li	1
-2	Autosampler	For the Ion Chromatograph (Dionex DX-120)	1
W-(3)-1	Porarograph	For the analysis of Hg, CN, Cr+6	1
-2	Spectrophotometer	For the investigation of nutrients	1
W-(4)-1	Flame Atomic Absorption Spectrophotometer	For the determination of Heavy Metals	1
-2	Ion Chromatograph	For the analysis of anions and cations	1
W-(5)-1	pH meter	For the pH measurement	4
-2	DO meter	For the DO measurement	2
-3	Temperature	Temperature measurement	
-4	Residual chlorine meter	Residual chlorine measurement	5
-5	Turbidity meter	Turbidity measurement	1
W-(6)-1	Adsorbent filters holder	For concentrating the sample in the microbiological analysis	3 set
-2	Pressure vessel	ditto	2
-3	Positive pressure source	ditto	1 set
-4	Electronegative virus adsorbent filters	ditto	each 100

2. JVA Lab.

No.	Equipment	Purpose	Number
J-1	Atomic Absorption with Graphite Furnace	For analyzing heavy metals in water and soil	1
J-2	Automatic Titration System	For COD determination	1
J-3	Automatic Titration System	For BOD determination	1
J-4	Draft chamber	For organic substances	1
J-5	Draft chamber	For strong acid	1
J-6	Ion Chromatograph	For anion determination in water and soil	1
J-7	Field combined detectors(EC,DO and TEMP)	For investigation of water quality	1
J-8	Macro-Kjeldahl digestion system	For analysis of nitrogen compound in plant and soil	1
J-9	Water Distillation Apparatus with Deionizer	For chemical analysis	1
J-10	Four wheel pickups	For collecting samples in the remote monitoring sites	2

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3. Environmental Research Center

No.	Equipment	Purpose	Number
E-1	ICP-MS	For supplying the demand for the increase of heavy metal analysis	1
E-2	Mercury analyzer (Gold Amalgam Method)	For improvement in the evil practices caused by combined use	1
E-3	Fluorescent Microscope	For diagnosis of pathogenic protozoa such as Giardia cysts and Cryptosporidium cysts in drinking water and other water sources in Jordan.	1 set
E-4	Automatic Titration System	For supplying the demand for increased microbiological test.	1
E-5	Autocrave	ditto	1
E-6	Six way filtration System	ditto	1
E-7	Microwave Digestion System	For monitoring the polluted soil and foods by heavy metals.	1

Table-3 List of Requested Telemetry Equipment

		Monitoring center	Monitoring stations	Laboratories
1	Data Processor	1		
2	Main Server	1		
3	Personal Computer	14	13	3
4	Laser Printer	14	13	3
5	Leased Line Rack Modem	*1		
6	Dial-up Stand alone Modems	*1		
7	Multiprotocol Routers(Large)	2		
8	Multiprotocol Routers(Small)	1		
9	System Line Printer	1		
10	Page Printer	2		
11	LAN Infrastructure	*1		
12	Uninterrupted Power Supply	*1	13	
13	Lightning Arrester	*1	13	
14	Operating Consoles and Desks	*1	13	3
15	Accessories	*1		
16	Software	*1		
17	Wiring Work	*1	13	3
18	Power Supply Unit	*1	13	3
19	Data Logger		13	
20	Modem Interface		13	3
21	Modem & Telephone		13	3

Note) *1 means 1 set.

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Japan's Grant Aid Scheme

1. Grant Aid Procedures

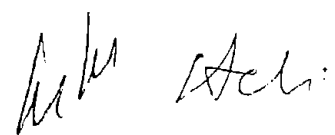
- (1) Japan's Grant Aid Program is executed through the following procedures.
- | | |
|---------------------------------|--|
| Application | (Request made by a recipient country) |
| Study | (Basic Design Study conducted by JICA) |
| Appraisal & Approval | (Appraisal by the Government of Japan and Approval by Cabinet) |
| Determination of Implementation | (The Notes exchanged between the Governments of Japan and the recipient country) |
- (2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request. Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s). Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval. Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country. Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

- (1) Contents of the Study
- The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:
- Confirmation of the background, objectives, and benefits of the requested project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
 - Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
 - Confirmation of items agreed on by both parties concerning the basic concept of the Project.
 - Preparation of a basic design of the Project
 - Estimation of costs of the Project

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

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



(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

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

(2) Exchange of Notes (E/N)

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

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

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

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

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

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

(5) Necessity of "Verification"

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

(6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

- 1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
- 2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
- 3) To secure buildings prior to the procurement in case the installation of the equipment.
- 4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
- 5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and

services under the Verified Contracts.

- 6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

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

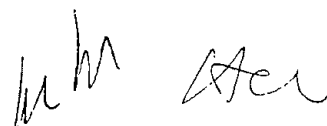
- (8) "Re-export"
The products purchased under the Grant Aid should not be re-exported from the recipient country.

- (9) Banking Arrangements (B/A)
 - 1) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
 - 2) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

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**Necessary measures to be taken by
the Hashemite Kingdom of Jordan
on condition that Japan's Grant Aid is extended.**

1. To secure the land necessary for monitoring stations prior to the commencement of the procurement of the equipment for the Project and provide necessary works for the stations during the execution of the Project.
2. To support prompt execution for customs clearance of the equipment imported to the Jordan under the Grant Aid.
3. To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contracts such facilities as may be necessary for their entry into the Jordan and stay therein for the execution of their work.
4. To exempt Japanese nationals from custom duties, internal taxes and other fiscal levies which may be imposed in the Jordan with respect to the supply of the products and services under the verified contracts.
5. To maintain and use the equipment provided under the Grant Aid properly and effectively and to assign the staff necessary for operation and maintenance for the equipment.
6. To bear all the expenses other than those to be borne by the Grant Aid necessary for the execution of the Project.
7. To bear advising commissions for Authorization to Pay and payment commission to a Japanese bank for the banking services based upon the banking arrangement.

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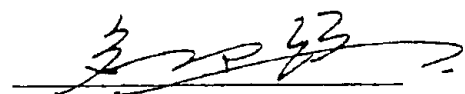
MINUTES OF DISCUSSIONS
ON
IMPLEMENTATION REVIEW STUDY
ON
THE PROJECT FOR WATER POLLUTION MONITORING SYSTEM
IN
THE HASHEMITE KINGDOM OF JORDAN

In November 1999, the Japan International Cooperation Agency (JICA) dispatched the Basic Design Study Team on the Project for Water Pollution Monitoring System (hereinafter referred to as "the Project") to the Hashemite Kingdom of Jordan (hereinafter referred to as "Jordan"), and through discussions, field survey, and technical examination of the results in Japan, JICA has prepared the Draft Report of the Basic Design on the Project.

In order to explain and to consult Jordanian side on components of the Outline of the Basic Design, JICA sent to Jordan the Implementation Reviewing Team, which is headed by Mr. Satoshi Iwakiri, Senior Assistant for Grant Aid, Economic Cooperation Bureau, Ministry of Foreign Affairs (hereinafter referred to as "the Team"), and is scheduled to stay in Jordan from January 5 to 25, 2002. The Team held discussions with the officials concerned of the Government of Jordan and conducted a field survey at the study area.

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

Amman, January 24, 2002



Mr. Satoshi Iwakiri
Leader
Implementation Review Study Team
Japan International Cooperation Agency



Dr. Munther Al-Masri
Secretary General
The Higher Council for Science and
Technology

ATTACHMENT

1. Components of the Outline of the Basic Design

The Jordanian side has agreed and accepted in principle the components of the draft report proposed by the Team.

2. Project site

The Project Site is shown in Annex I.

3. Responsible and Implementing Agency

The Responsible Agency and Implementing Agency of the Project is the Higher Council for Science and Technology (HCST).

4. Items requested by the Jordanian side

After discussion with the Team, the items finally requested by the Jordanian side are shown in Annex II.

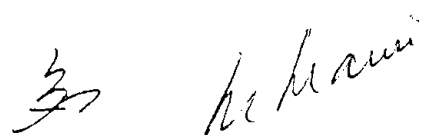
Civil work for the installation of the monitoring equipment was requested by the Jordanian side.

Spare parts for two-year operation of the continuous monitoring and chemical analysis equipment were requested by the Jordanian side.

Technical advisors for the smooth operation and proper maintenance of the following equipment to be provided under the Project were also requested to be dispatched to Jordan at the final stage of the Project by the Jordanian side.

- Continuous monitoring equipment
- Chemical analysis equipment
- Telemetry system

However, final items to be constructed and procured under Japan's Grant Aid will



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be decided after further studies in Japan.

5. Japan's Grant Aid Scheme

The Jordanian side has understood the system of Japan's Grant Aid Scheme as explained by the Team and will take the necessary measures described in Annex-IV of the Minutes of Discussions signed on the 23rd of November, 1999 by both sides.

6. Further Schedule of the Study

Based on the Minutes of Discussions and technical examination of the study results, JICA will complete the final report and send it to the Government of Jordan around April 2002.

7. Other Relevant Issues

The following were discussed and confirmed by both sides.

(1) Importance of utilization of monitored data for environmental protection

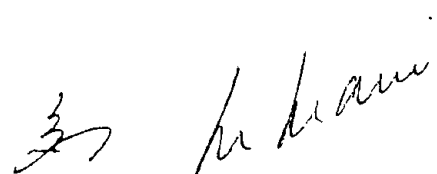
The Team explained the importance of utilization of monitored data for environmental protection.

The Jordanian side explained that the monitored data will be utilized for the environmental protection by the Government of Jordan as follows.

Authorities and institutions concerned

The main authorities and institutions concerned with the data coming out of the Project are:

- The General Corporation for Environment Protection (GCEP)
- Ministry of Water and Irrigation
 - Jordan Valley Authority (JVA)
 - Water Authority of Jordan (WAJ)



- The Royal Scientific Society (RSS)
 - Environmental Research Center (ERC)

Procedure for utilization of monitored data

The procedure for the utilization of the monitored data shall be as follows.

- Central Unit for Environmental Pollution Monitoring (CUEP) is organized and located in RSS to execute operation and maintenance for the water pollution monitoring system consisting of 13 monitoring stations and the monitoring center to be established under the Project.
- CUEP analyzes the water quality data collected in the monitoring center from the monitoring stations and the related authorities/institutions.
- CUEP reports the results of the analysis to the Managing Board of the National Environmental Pollution Research and Monitoring System (NEPRAMS).
- In case that extraordinary change is found in the monitored water quality data, the Managing Board discusses this matter and determines the countermeasures to solve the problem.
- In response to the decision of the Managing Board, GCEP takes necessary actions according to the environmental law.

Managing Board of NEPRAMS

The Managing Board of NEPRAMS is chaired by the Minister of Municipal and Rural Affairs and the Environment. The General Director of the General Corporation for Environment Protection (GCEP) is the deputy chairman of the Managing Board. It consists of the following members.

- Secretary General of the Ministry of Agriculture
- Secretary General of the Ministry of Health and Medical Care
- Secretary General of the Ministry of Water and Irrigation
- Secretary General of the Ministry of Energy and Mineral Resources
- Director General of the General Corporation for Environment Protection
- Secretary General of Jordan Valley Authority
- Secretary General of the Water Authority of Jordan
- Secretary General of the Higher Council for Science and Technology
- President of the Royal Scientific Society



The Managing Board shall be convened periodically or whenever it is needed, especially when an extraordinary situation in the water quality occurs.

Role of GCEP

GCEP is the institution officially in charge of monitoring the environment. It was established according to the law No.12 for the year 1995. This law gives GCEP the authority to implement the environment law and to take necessary measures in case of violation.

Therefore, in order for GCEP to be able to monitor the environment and since it does not have the technical capability to do so, GCEP, since its establishment, has been contracting ERC to carry out this task. Based on the report from ERC, they have been working for water pollution protection.

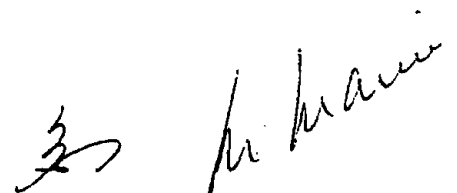
The Project will give GCEP direct access to the parameters monitored continuously in 13 monitoring stations and intermittently in other locations. This will strengthen its position in inspecting any source of pollution before it starts to threaten any major water source. Therefore, they can take legal actions to prevent that. Eventually, this will contribute a great deal to controlling any pollution source and protecting the environment.

(2) Permission /Approvals of the authorities concerned

The Jordanian side has agreed to obtain the permission and approval necessary for the installation of the monitoring stations by August 2002.

(3) Data Provision from the related authorities for the Project

The Jordanian side explained that the related authorities of Jordan Valley Authority (JVA), Water Authority of Jordan (WAJ) and Environment Research Center (ERC) have already agreed in principal to provide the required data as shown below for the Project and the details of the data provision such as parameters, frequency, media, etc. will be determined by the commencement of the operation of the monitoring system.



WAJ

1. Water quality data measured by Early Warning System at Zai Water Treatment Plant (by off-line)
2. Water quality data measured intermittently in the whole Jordan (by off-line)

JVA

1. Water flow data measured by Dirar Control Center (by off-line)
2. Water quality data measured intermittently in Jordan Valley (by off-line)

ERC

- Water quality data measured intermittently in the whole Jordan (by on-line)

(4) The work to be done by the Jordanian side

The Jordanian side has agreed to arrange the land acquisition for the monitoring stations by August 2002. The Jordanian side has also agreed to complete the preparation of communication and electrical facilities required for the equipment to be provided under the Project by December 2002.

The Jordanian side explained that, for the land acquisition, the Ministry of Water and Irrigation has already approved the usage of the required land for the monitoring stations in principle.

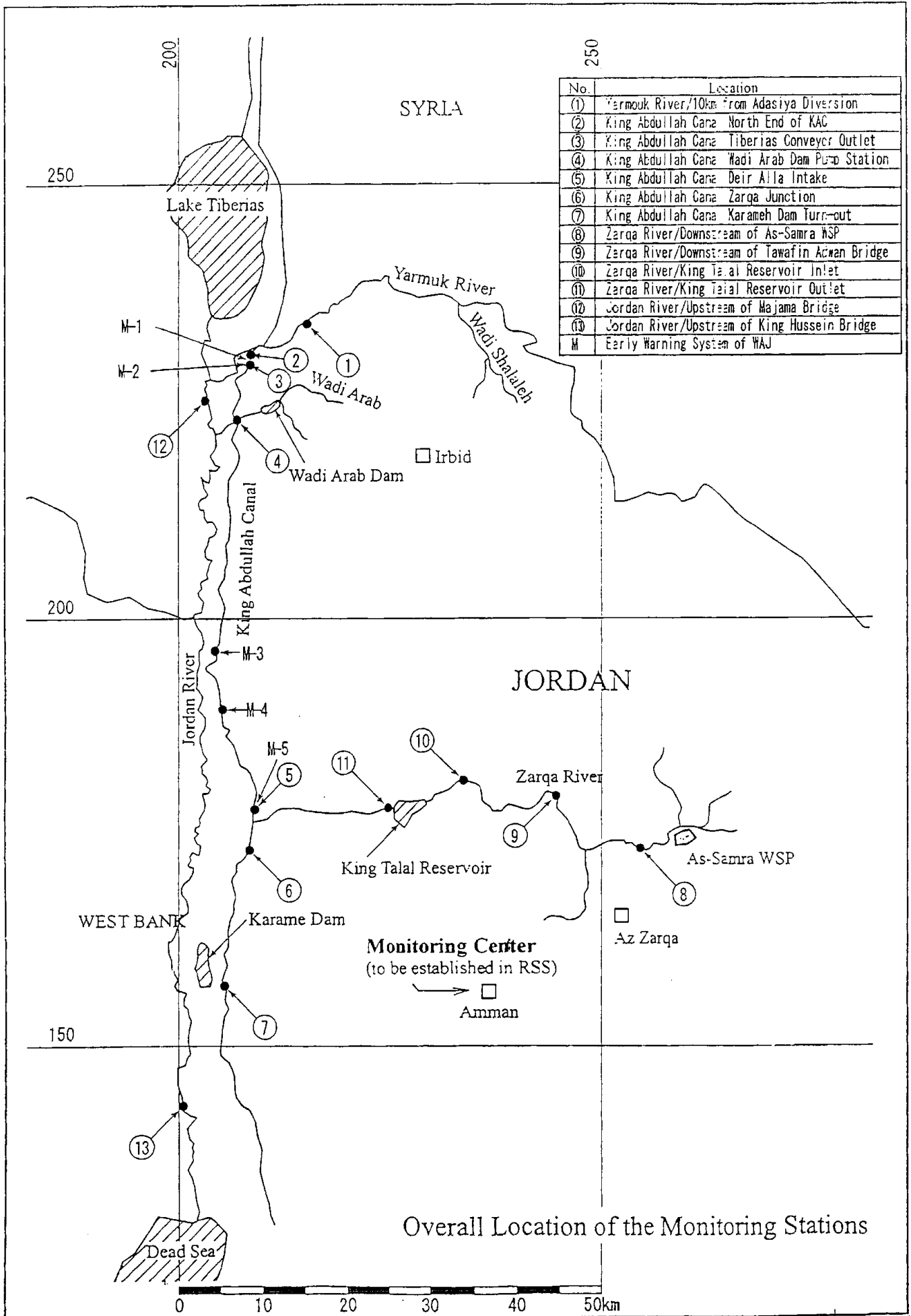
(5) Operation and Maintenance

The Jordanian side has agreed to secure the necessary staff and budget to execute operation and maintenance of the monitoring equipment to be provided under the Project by January 2003.

The Jordanian side stated that, since the operation and maintenance of the monitoring equipment to be provided under the Project has already been approved by HCST, the necessary staff and budget shall be secured accordingly.



Al Hani



Overall Location of the Monitoring Stations

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Annex II - 1 List of Requested Equipment for Monitoring Station

STN No.	Location	Thermo-meter	pH Meter	DO Meter	EC Meter	TB Meter	COD Meter	T-N Analyzer	T-P Analyzer
①	Yarmouk River/10km from Adasiya Diversion	○	○	○	○	○	○	○	○
②	KAC/North End of KAC	○	○	○	○	○	○	○	○
③	KAC/Tiberias Conveyor Outlet	○	○	○	○	○	○	○	○
④	KAC/Wadi Arab Dam Pump Station	○	○	○	○	○	○	○	○
⑤	KAC/Deir Alla Intake	○	○	○	○	○	○	○	○
⑥	KAC/Zarqa Junction	○	○	○	○	○	○	○	○
⑦	KAC/Karameh Dam Turn-out	○	○	○	○	○	○	○	○
⑧	Zarqa River/Downstream of As-Samra WSP	○	○	○	○	○	○	○	○
⑨	Zarqa River/Downstream of Tawafin Adwan Bridge	○	○	○	○	○	○	×	×
⑩	Zarqa River/King Talal Reservoir Inlet	○	○	○	○	○	○	○	○
⑪	Zarqa River/King Talal Reservoir Outlet	○	○	○	○	○	○	×	×
⑫	Jordan River/Upstream of Majama Bridge	○	○	○	○	○	○	○	○
⑬	Jordan River/Upstream of King Hussein Bridge	○	○	○	○	○	○	×	×

○ Installed in the station

× Not installed in the station

KAC : King Abdullah Canal

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Annex II - 2 List of Requested Chemical Analysis Equipment for Laboratories

1. WAJ Laboratory

No.	Equipment	Quantity	Purpose
W-1	High speed liquid chromatograph	1	Analysis of agricultural chemicals, etc
W-2	Flow injector	1	Analysis of alkalinity, acidity, etc
W-3	Electrochemical detector	2	Cyanide and mercury detection
W-4	Spectrophotometer	1	Analysis of inorganic substance
W-5	Ion chromatograph (IC) (with auto sampler)	1	Analysis of inorganic
W-6	Field survey set	6	Detection of pH, DO, temp, chloride,
W-7	ICP- Mass spectrometer (ICP-MS) (with pure water equipment)	1	Analysis of trace heavy metal in drinking water

2. JVA Laboratory

No.	Equipment	Quant	Purpose
J-1	ICP-AES	1	Analysis of heavy metals
J-2	Automatic titration system	1	Analysis of COD
J-3	Automatic titration system	1	Analysis of BOD
J-4	Draft chamber	1	Treatment of organic substances
J-5	Draft chamber	1	Treatment of strong acid
J-6	Hand held analyzer	1	For sample field analysis
J-7	Macro-kjeldahl digestion system	1	Pretreatment of nitrogen samples
J-8	Water distillation	1	Manufacturing of pure water for analysis
J-9	Gas chromatograph with Mass spectrometer (GC-MS) (with pure water equipment)	1	Analysis of agricultural chemicals

3. ERC Laboratory

No.	Equipment	Quantity	Purpose
E-1	ICP-Mass spectrometer (ICP-MS) (with pure water equipment)	1	Analysis of trace heavy metals, etc
E-2	Mercury analyzer (Gold Amalgam Method)	1	Analysis of mercury
E-3	Fluorescent	1	Analysis of bacteria
E-4	Automatic titration system	1	Automatic titration of BOD, COD, etc
E-5	Autoclave	1	For sterilization
E-6	Six way filtration system	1	Shortening of filtration time in bacteria inspection
E-7	Microwave digestion system	1	Pretreatment of sample
E-8	Pure water equipment	1	Production of pure water for the monitoring stations

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Annex II - 3 List of Requested Telemetry Equipment for Monitoring Center

Requested Item	Quantity	Description
Data processor	1 set	One Internet server and one 21-inch CRT are required for viewing and processing information via the Internet.
Main server	1 set	One main server and one 21-inch CRT are required for collecting, managing, storing and analyzing data.
Personal computer	5 units	Four (4) PC are sufficient for carrying out viewing of measurement data and analysis results, etc. and for performing water quality monitoring work such as printing, but one network management PC is also required to manage the network in the Monitoring Center.
Laser printer	2 units	One (1) high speed black and white page printer and one(1) color printer are enough for the monitoring center.
Leased line rack modem	14 units	Leased line modems for carrying out communications with the monitoring stations and GCEP. Rack-mount type modems shall be adopted and thirteen (13) are required for the monitoring stations and one (1) is for GCEP.
Dial-up stand alone modems	1 unit	One (1) public telephone line modems is required to carry out communications between the monitoring center and ERC laboratory.
Multi-protocol router Router	1 unit	After connecting with NIC by optical fiber cable, one Internet connection router is required to carry out communications for information disclosure on the Internet.
Multi-protocol router Access server	1 unit	One access server for connecting to analog lines is required to collect and process data from stations, laboratories and related agencies via analog telephone lines.
LAN, switch, hubs, cable	1 set	One Ethernet mutual connection switch and server are required for mutually linking devices in the monitoring center to LAN, and one Ethernet cable set is required for mutually connecting the server, each PC and routers.
Uninterrupted power supply	1 unit	This is required for shutdown work at times of power failure. Backup time is roughly 10 hours.
Lightning arrester	2 sets	Two sets are required, one each for the power lines and the telephone lines.
Accessories	1 set	One tape drive is required for server backup. Four (4) internal CD-RW drives are installed in the PC for backup.
Software	1 set	Database management software and network management software are required.
Wiring work	1 set	Laying of network cable within the Monitoring Center shall be borne by the Japanese side. The laying of exclusive analog lines, public telephone lines, optical fiber cables and power lines to the Monitoring Center shall be borne by the Jordanian side.

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Annex II - 4 List of Requested Telemetry Equipment for Monitoring Stations

Requested Item	Quantity	Description
Data system logger Personal computer	13 sets	As items for dealing with the logger, a input module and digital input/output module are required. These will be installed inside the PC, which will be an FA type. For higher reliability, the program shall be in ROM format and shall be stored on disc. A semiconductor disc shall be installed for data backup. For maintenance work, a monitor showing the operating conditions of measurement devices shall be installed. No printer is required because conditions can be confirmed on monitor.
Modem, telephone	13 units	One leased line modem is necessary. Installation of the leased line shall be undertaken by the Jordanian side.
UPS	13 units	UPS is required for backup of the PC power source. Backup time is 10 hours.
Lightning arrester	13 sets	One each for the power lines and the telephone lines.
Cable	13 sets	Cable for connecting the PC and each measurement device is required. A console shall not be installed because room inside the units is small. Consoles shall be prepared by the Jordanian side, because there are standard item.
Wiring work	13 sets	Wiring work inside the monitoring unit shall be undertaken by the Japanese side. However laying of telephone lines and power lines to the system shall be undertaken by the Jordanian side

Annex II - 5 List of Requested Telemetry Equipment for ERC Laboratory and GCEP

Requested Item	Quantity	Description
Personal computer Printer	2 sets	Two (2) PC and two (2) ink jet printers are required for transmitting measurement data to the monitoring center.
Modem, telephone	2 sets	One (1) public telephone line modem is necessary for ERC and one (1) leased line modem is necessary for GCEP. Installation of the telephone line shall be undertaken by the Jordanian side.
Lightning arrester	2 sets	Two (2) sets of lightning arrester are required for the power lines and the telephone line protection.
Cable	2 sets	Two (2) sets of cable are required for the printer and modem. Consoles shall be prepared by the Jordanian side, because there are standard item.
Wiring work	2 sets	Wiring work around computer shall be undertaken by the Japanese side. However laying of telephone lines and power lines to the system shall be undertaken by the Jordanian side.

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資料一6 事業事前評価表

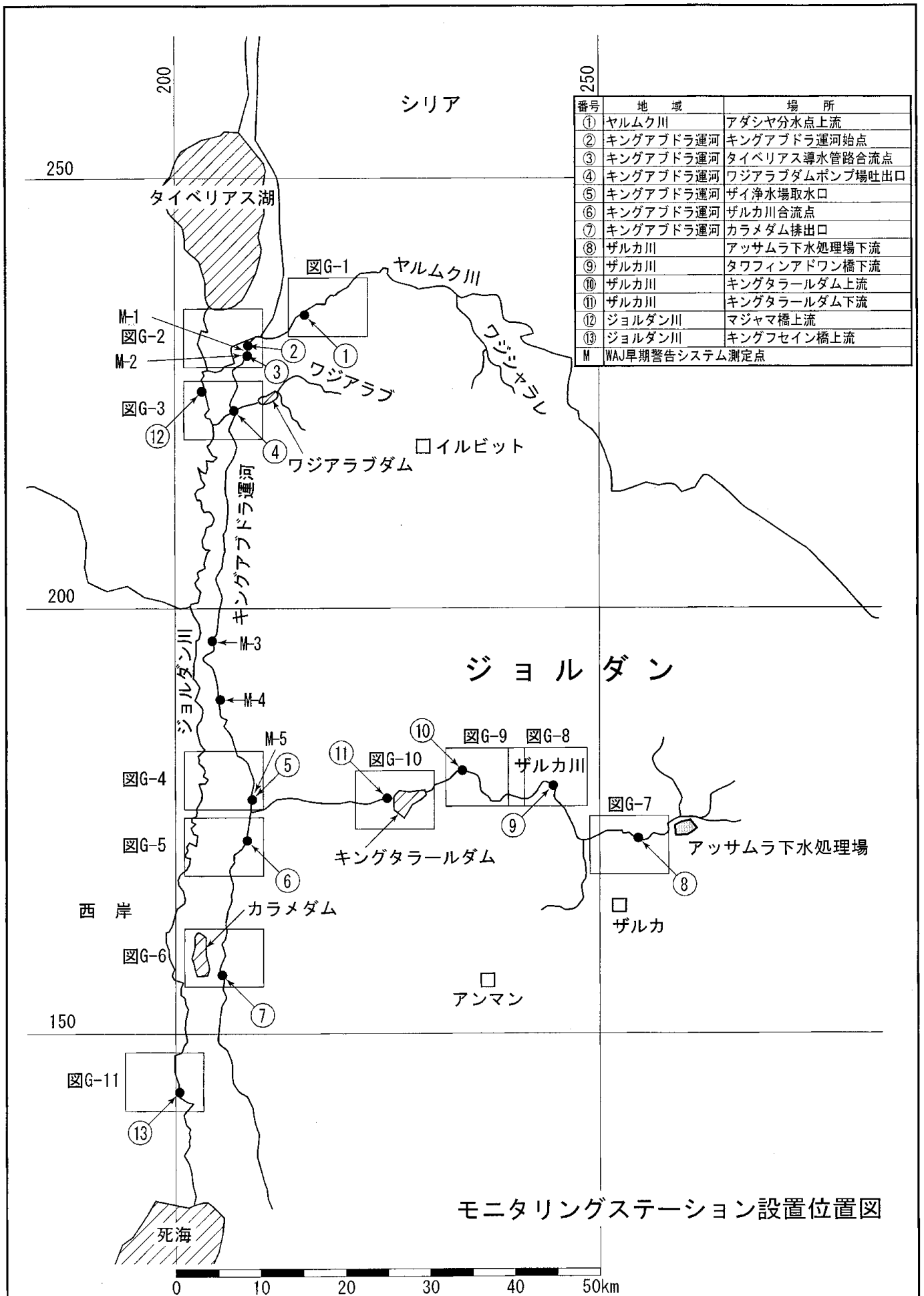
資料－６ 事業事前評価表

1. 協力対象事業名	ジョルダン国水質汚染監視計画
2. 我が国が援助することの必要性・妥当性	<p>(1) 我が国は、ジョルダンが、①中東和平プロセスの当事国として同プロセスにおいて積極的な取り組み及び貢献を行っており、同国の政治的・経済的安定が中東地域の平和にとって重要であること、特に、現在ジョルダンはフセイン国王逝去後の移行期にあり、国際社会全体としてジョルダンを支援する必要性が一層高まっていること、②民主化及び経済改革に関し積極的に努力していること、③我が国との関係が良好であること等に鑑み、インフラ整備、人的資源開発等幅広い分野で各形態による援助を積極的に実施している。</p> <p>同国では、現在、1999年から2003年までを期間とする社会経済開発5ヵ年計画を実施中である。本5ヵ年計画では、2003年までに最適な国際規格の適用によって環境保全を図ること、そのための方策として環境監視能力の増強等、技術面・行政面での整備が重点目標の一つに挙げられている。なお、我が国はジョルダン側との政策対話を踏まえ、以下を重点分野としている。</p> <p>1) 基礎生活の向上 (a) 水供給 (b) 食糧 (c) 基礎的保健・医療 (d) 基礎教育</p> <p>2) 産業振興 (a) 輸出産業発展を目的とした人的協力及び資金協力 (b) 観光及び中継貿易のためのインフラ整備</p> <p>3) 環境保全</p> <p>(2) ジョルダンでは、1995年に環境保護法が制定され、環境行政を一元的に所管するため、環境・自治省管轄下の環境保護公社(GCEP)を設立すると共に、環境政策決定機関としての環境審議会を設立し、環境保護対策の推進を図っている。なお、環境基準の技術的な検討については、同国における科学・技術の最高レベルの研究機関である高等科学技術審議会(HCST)において実施されている。</p> <p>一方、1998年夏期に首都圏飲料水の水源となっている水域において藻が大量に発生し、飲料水の水質が悪化した問題を契機として、水質モニタリングシステムの構築による水質悪化の早期発見が緊急課題となっている。また、モニタリングデータを速やかに環境行政に反映させるため、環境行政実施機関であるGCEPの強化が課題となっている。</p>
3. 協力対象事業の目的(プロジェクト目標)	環境監視体制強化のため水質分野の環境モニタリング体制を整備する。
4. 協力対象事業の内容	<p>(1) 対象地域 ジョルダン北部地域</p> <p>(2) アウトプット モニタリングステーション13箇所、定点・定期化学分析用機器の拡充及びテレメトリシステム構築による水質汚染モニタリングシステムの整備</p> <p>(3) インプット ・ モニタリングステーション13箇所の設置 ・ 3試験所(WAJ、JVA及びERC)における定点・定期化学分析用機器の拡充 ・ テレメトリシステムの構築 ・ 調達機材の運用・維持管理に係る技術指導(ソフトコンポーネント導入)</p> <p>(4) 総事業費 概算事業費 9.23億円(日本側 8.68億円、ジョルダン側 0.55億円)</p> <p>(5) スケジュール E/Nから実施設計を含め11.5ヶ月の工期を予定</p>

(6) 実施体制 ジョルダン国高等科学技術審議会 (HCST) (なお、測定データの環境行政への反映は、HCST 統括のもと GCEP が実施)		
5. プロジェクトの成果		
(1) プロジェクトにて裨益する対象の範囲及び規模 ジョルダン北部地域 (アンマン、ザルカ、イルビッド、マフラック、バルカ)、裨益人口約 300 万人 (2001 年)		
(2) 事業の目的 (プロジェクト目標) を示す成果指標		
	実施前 (2001 年)	実施後 (2003 年)
連続水質モニタリング実施箇所数	6	19
連続水質モニタリング項目数	30	115
富栄養化を測る指標 (全リン、全窒素) の連続モニタリング箇所数	0	10
微量化学分析の精度 (mg/l)	10^{-3}	10^{-6}
GCEP が水質監視可能な箇所数	55	540
6. 外部要因リスク		
(1) 水質モニタリングシステムの運営・維持管理費用及び体制 本計画の実施機関である高等科学技術審議会 (HCST) は、運営・維持管理を実施する環境公害監視中央ユニット (CUEP) の組織を整備するとともに、本計画で整備されるモニタリング機材の運営・維持管理費用を確保する必要がある。		
(2) 先方負担事業の実施 本計画実施に必要な、モニタリングセンター用建物の確保、テレメトリシステム構築用通信回線の整備及びモニタリングステーション用の電源引き込み工事を、日本側実施工程に合わせて実施する必要がある。		
7. 今後の評価計画		
(1) 事後評価に用いる成果指標 連続水質モニタリング実施箇所数、連続モニタリング項目数、富栄養化を測る指標の連続モニタリング箇所数、微量化学物質の精度、GCEP が水質監視可能な箇所数		
(2) 評価のタイミング 2003 年を目処に事後評価を実施する予定。		

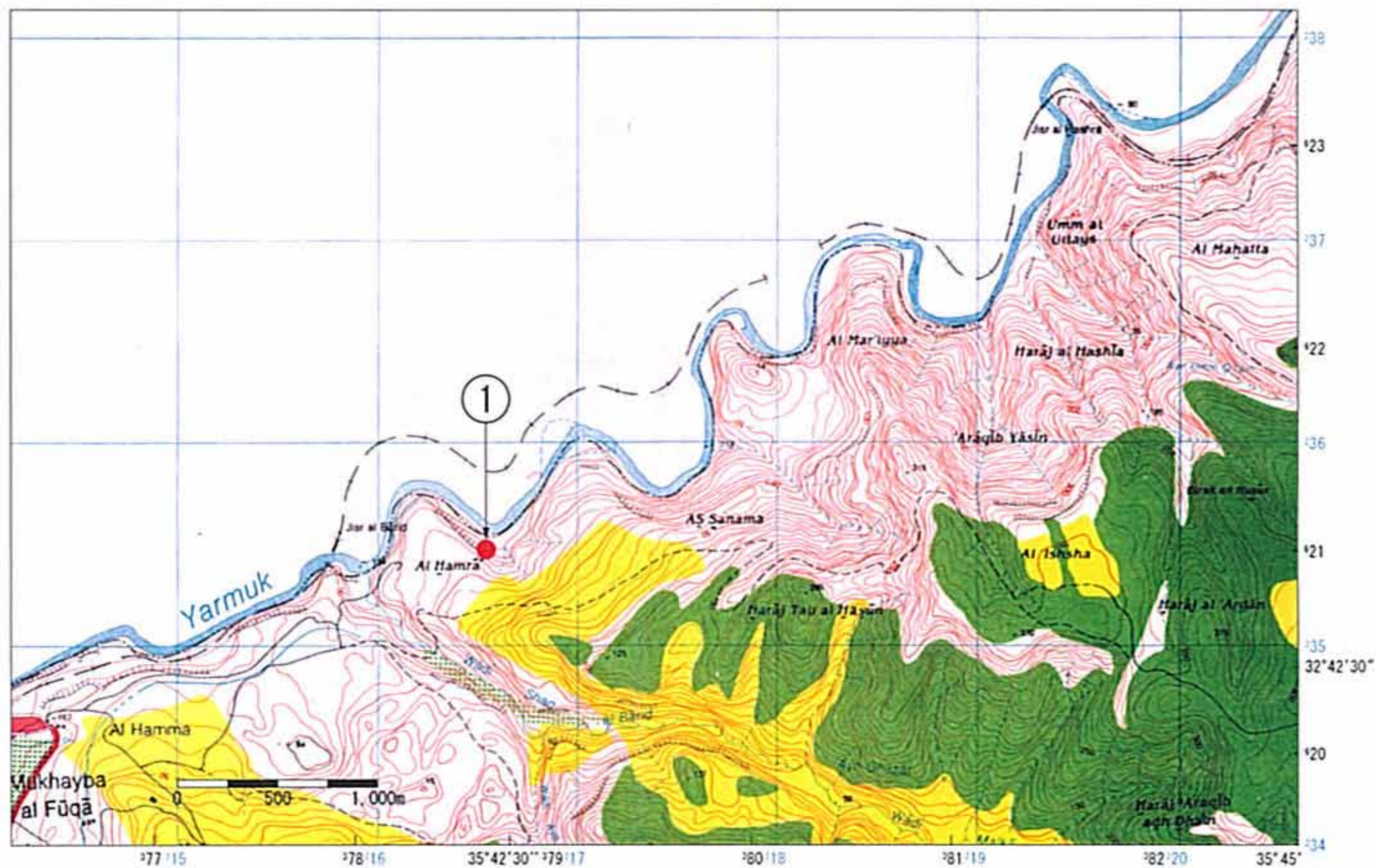
資料一7 参考資料／入手資料リスト

資料一8 モニタリングステーション
詳細位置図

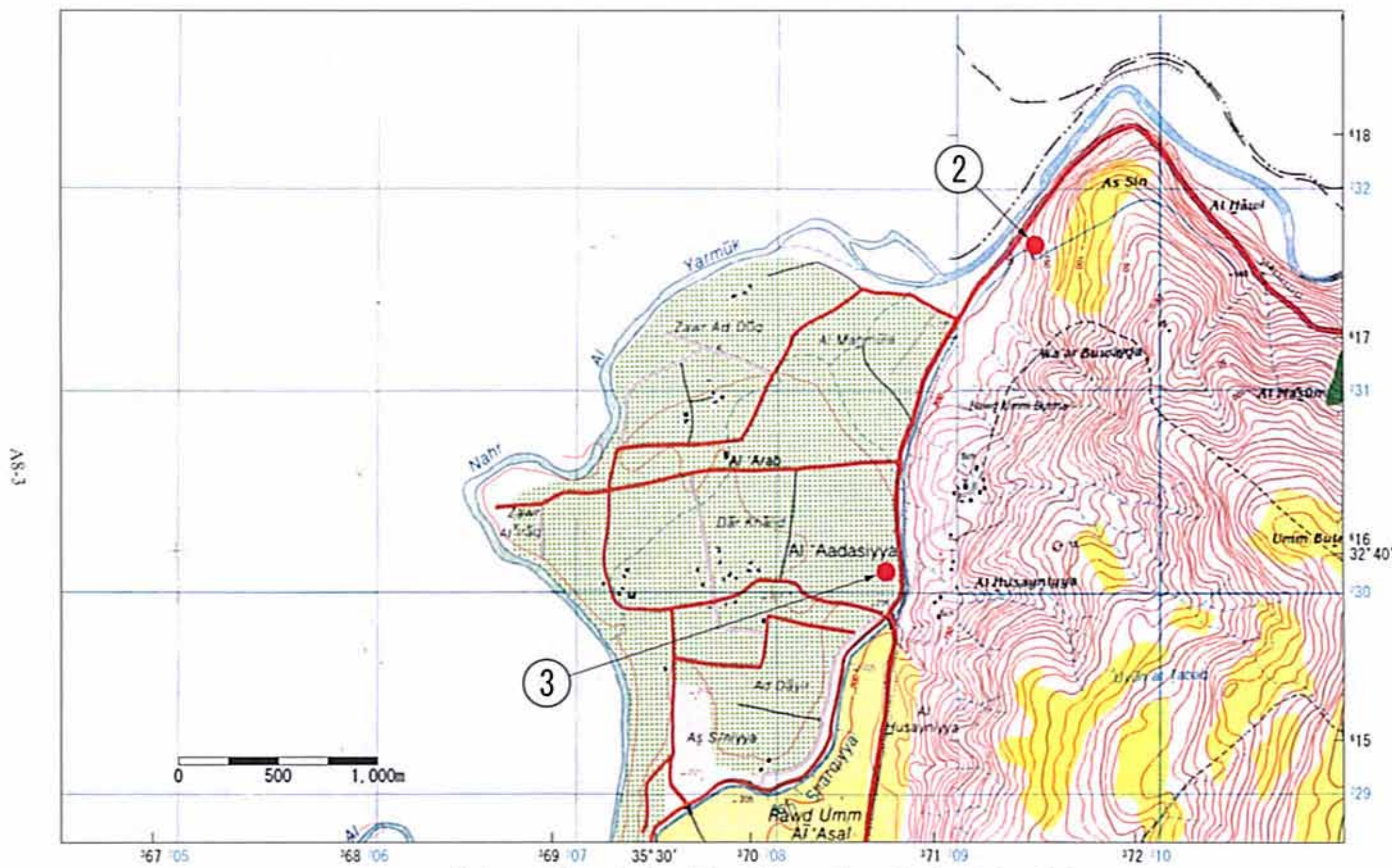


番号	地域	場所
①	ヤルムク川	アダシヤ分水点上流
②	キングアブドラ運河	キングアブドラ運河始点
③	キングアブドラ運河	タイベリアス導水管路合流点
④	キングアブドラ運河	ワジアラブダムポンプ場吐出口
⑤	キングアブドラ運河	ザイ浄水場取水口
⑥	キングアブドラ運河	ザルカ川合流点
⑦	キングアブドラ運河	カラメダム排出口
⑧	ザルカ川	アッサムラ下水処理場下流
⑨	ザルカ川	タワフィンアドワン橋下流
⑩	ザルカ川	キングタラールダム上流
⑪	ザルカ川	キングタラールダム下流
⑫	ジョルダン川	マジヤマ橋上流
⑬	ジョルダン川	キングフセイン橋上流
M	WAJ早期警告システム測定点	

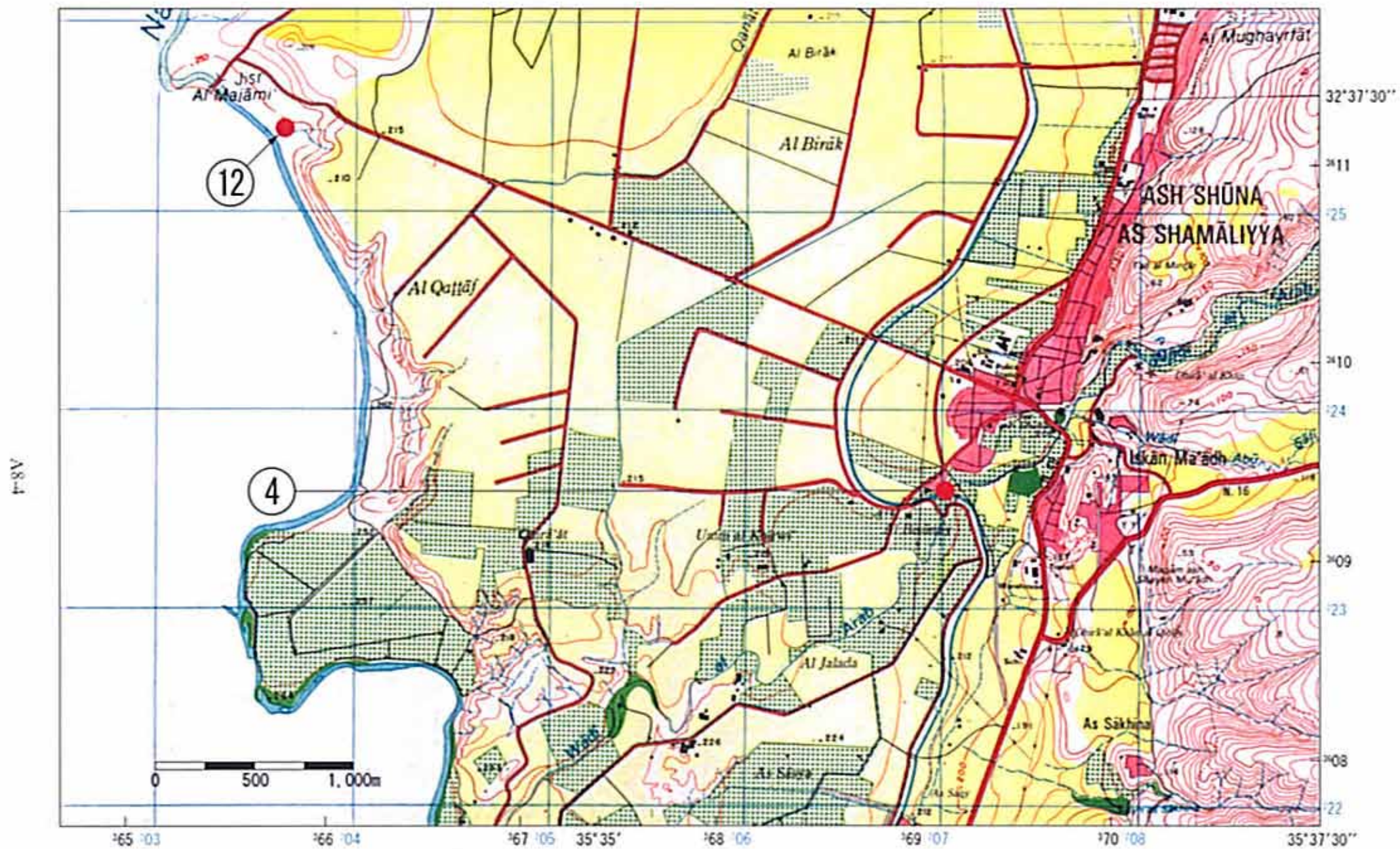
モニタリングステーション設置位置図



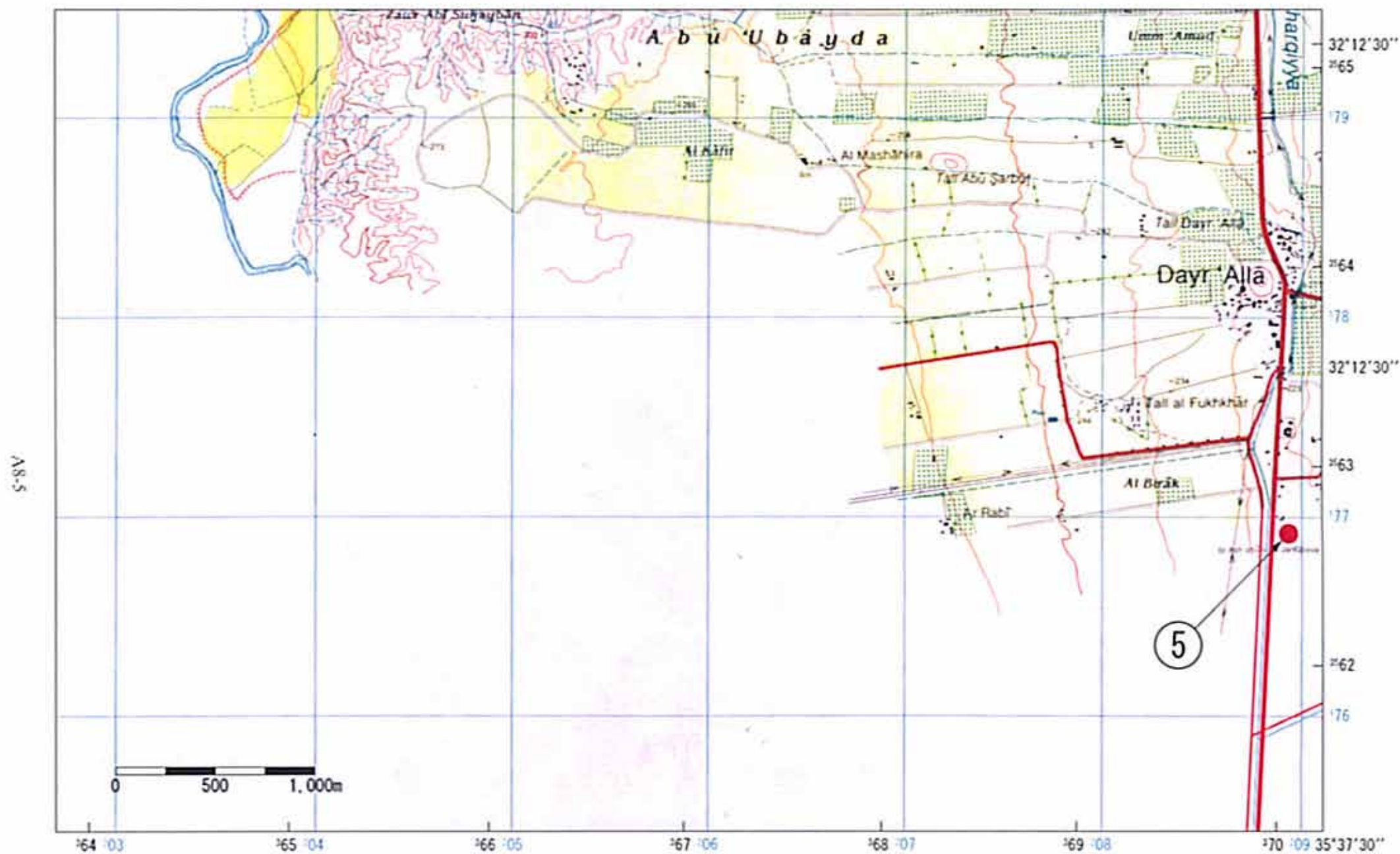
図G-1 ①ヤルムク川/アダシヤ分水点上流



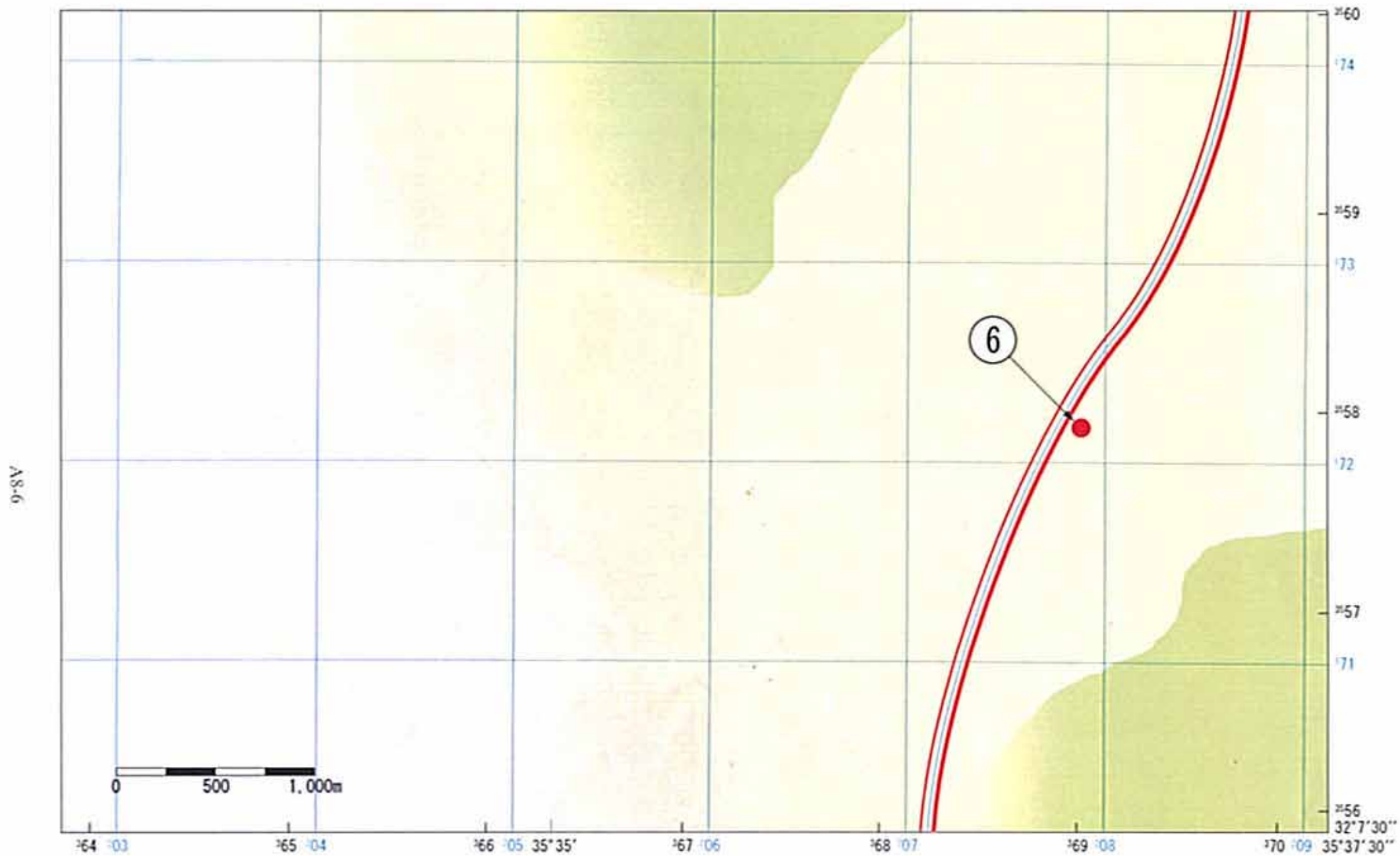
図G-2 ②キングアブドラ運河/キングアブドラ運河始点
 ③キングアブドラ運河/タイベリアス導水管路合流点



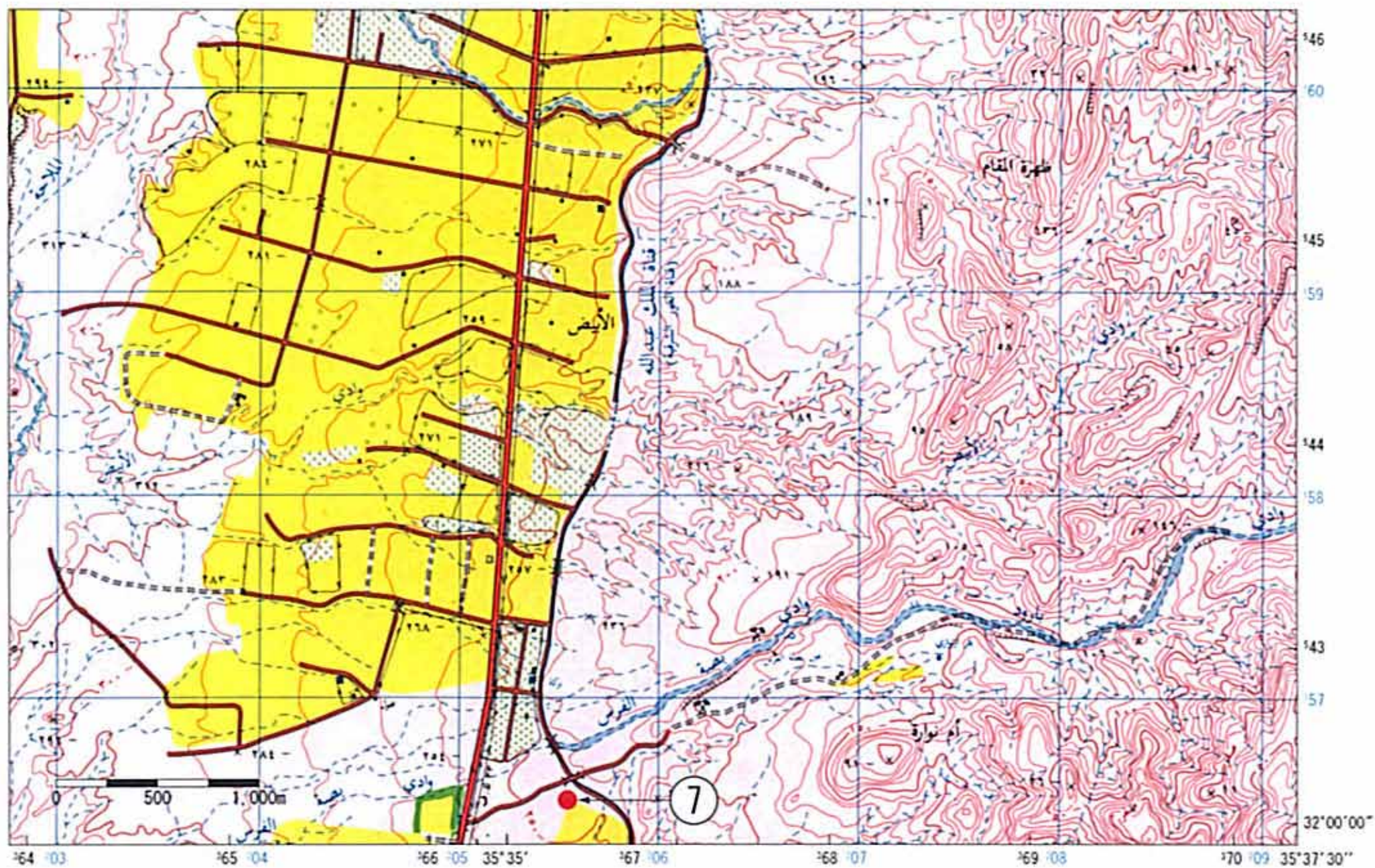
図G-3 ④キングアブドラ運河/ワジアラブダムポンプ場吐出口 ⑫ヨルダン川/マジヤマ橋上流



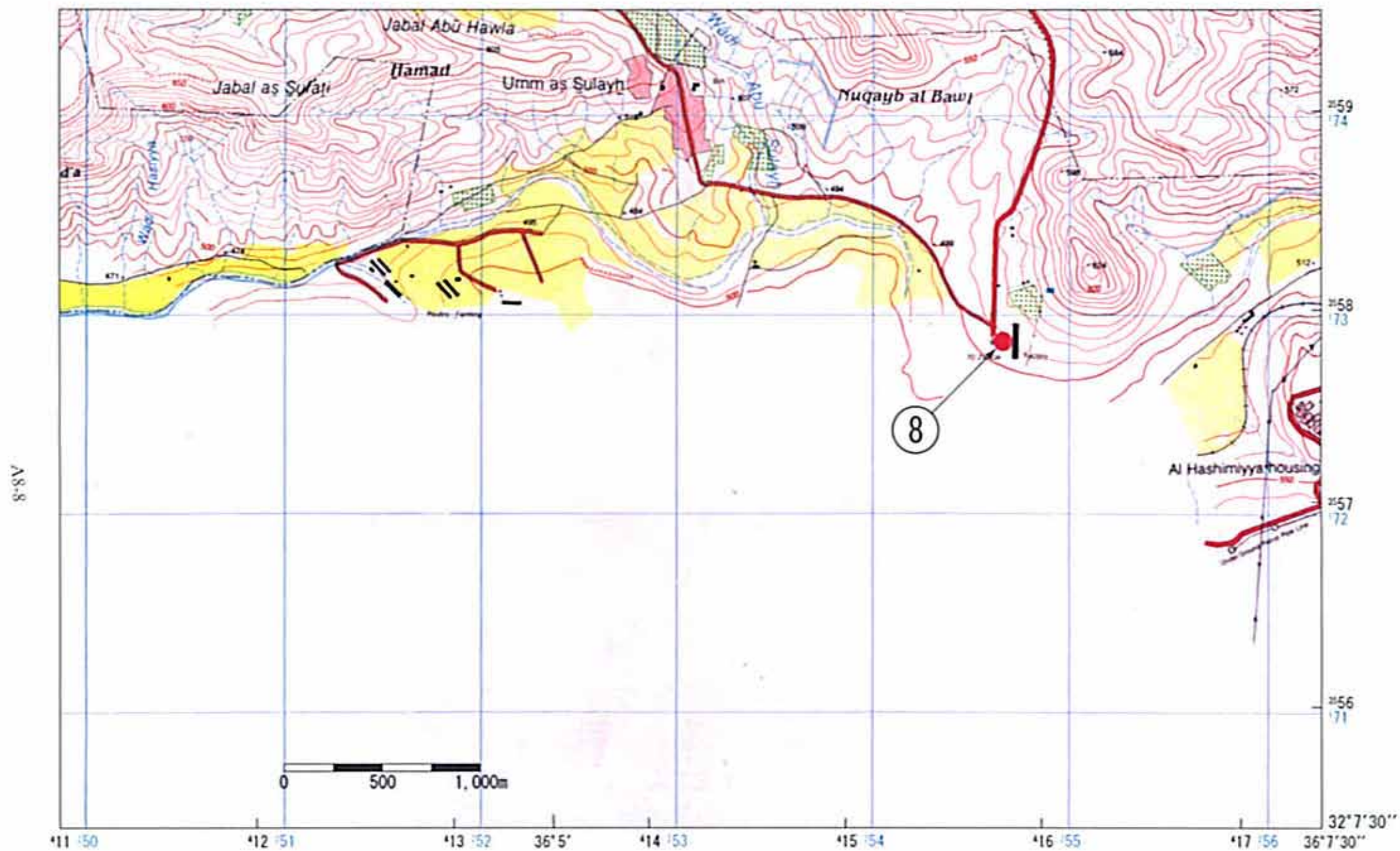
図G-4 ⑤キングアブドラ運河/ザイ浄水場取水口



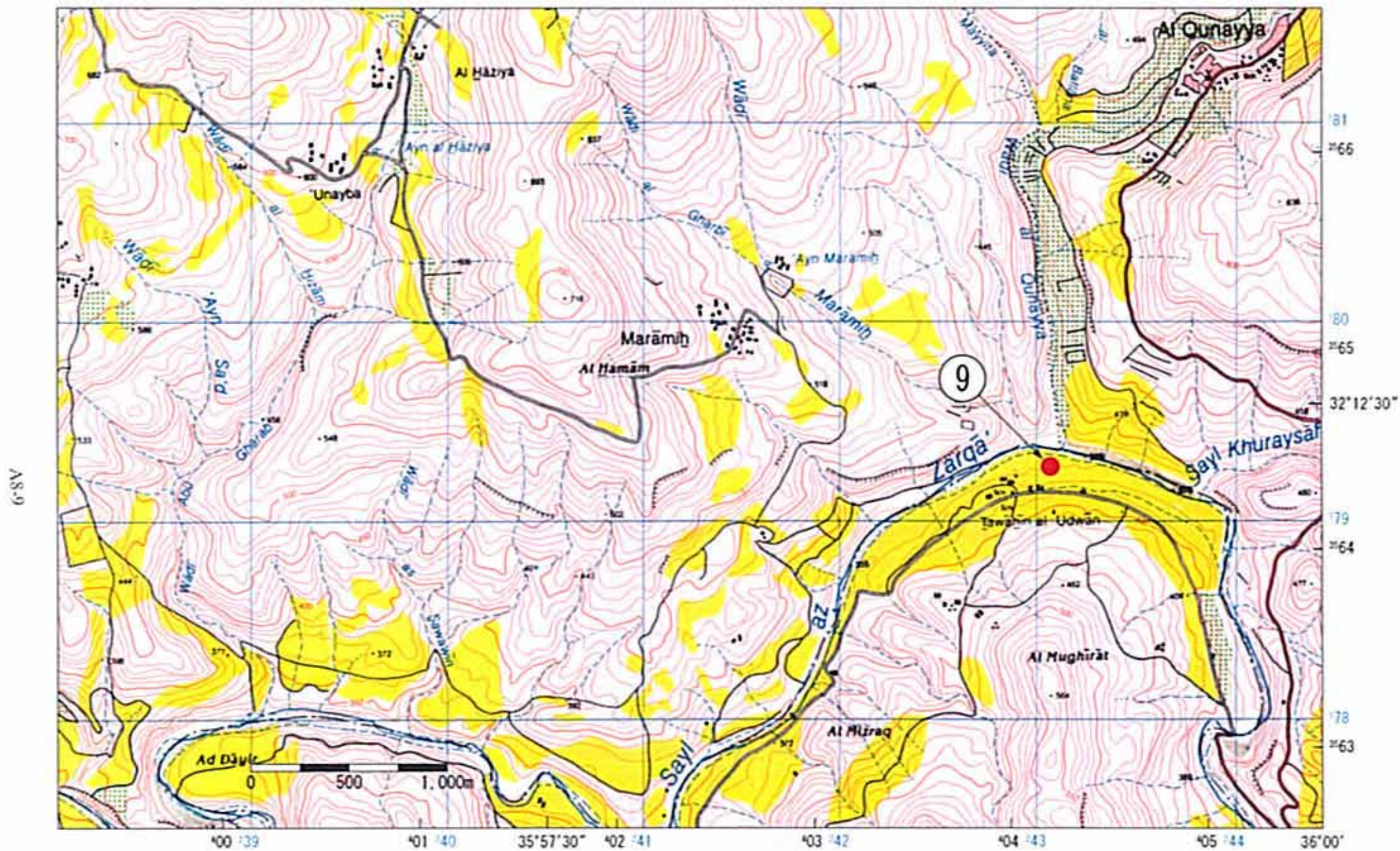
図G-5 ⑥キングアブドラ運河/ザルカ川合流点



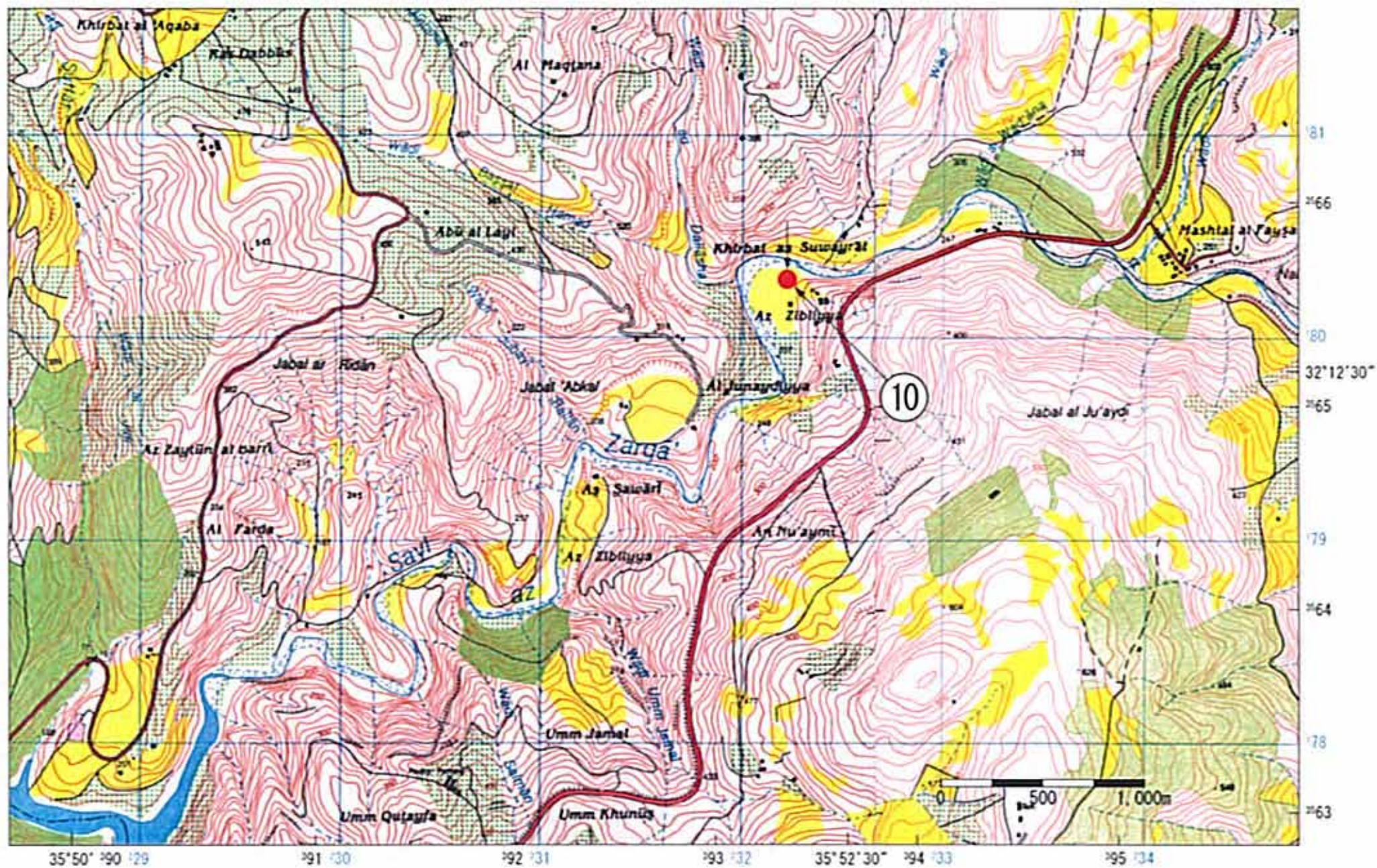
図G-6 ⑦キングアブドラ運河/カラメダム排出口



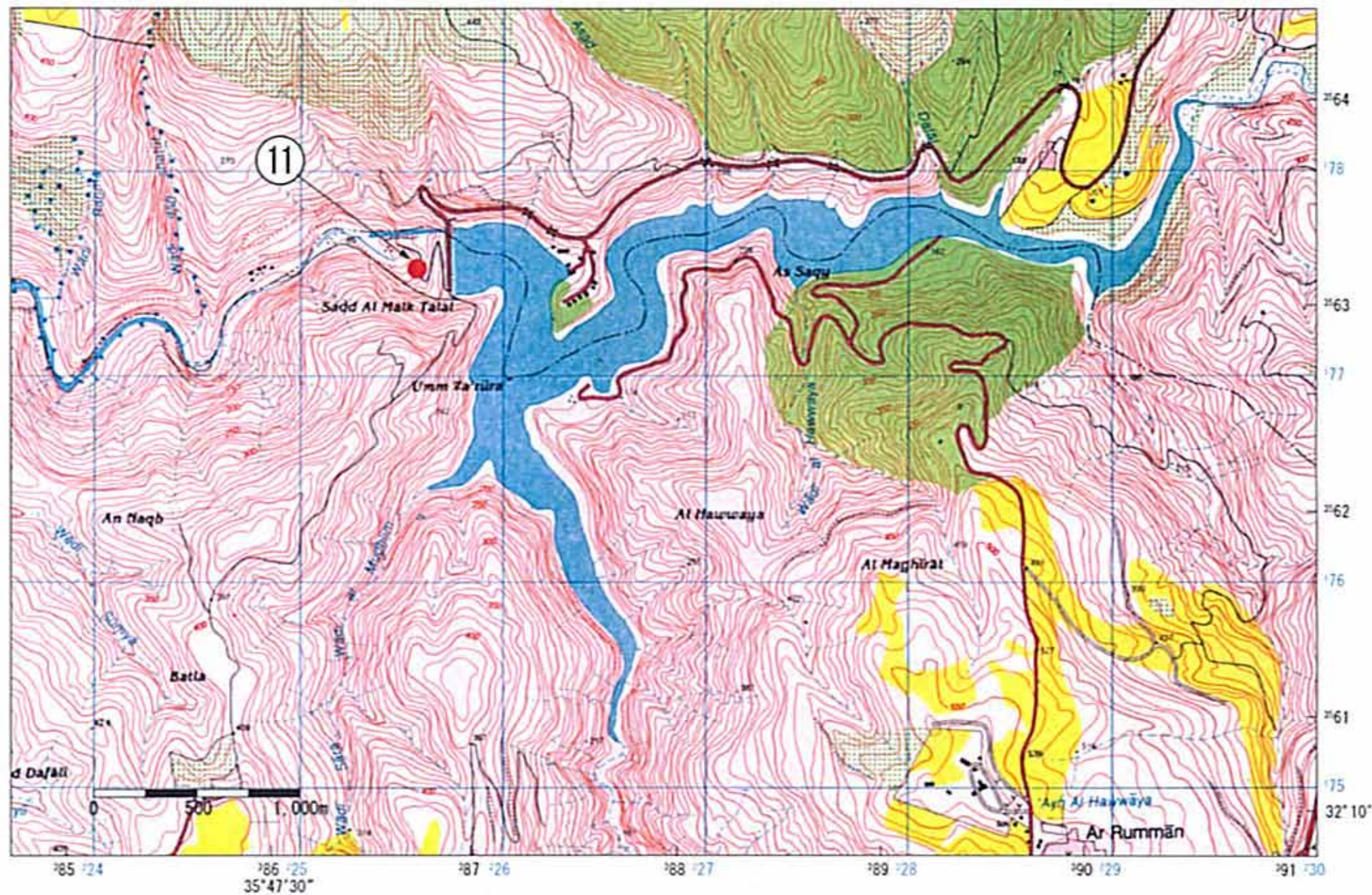
図G-7 ⑧ザルカ川/アッサムラ下水処理場下流



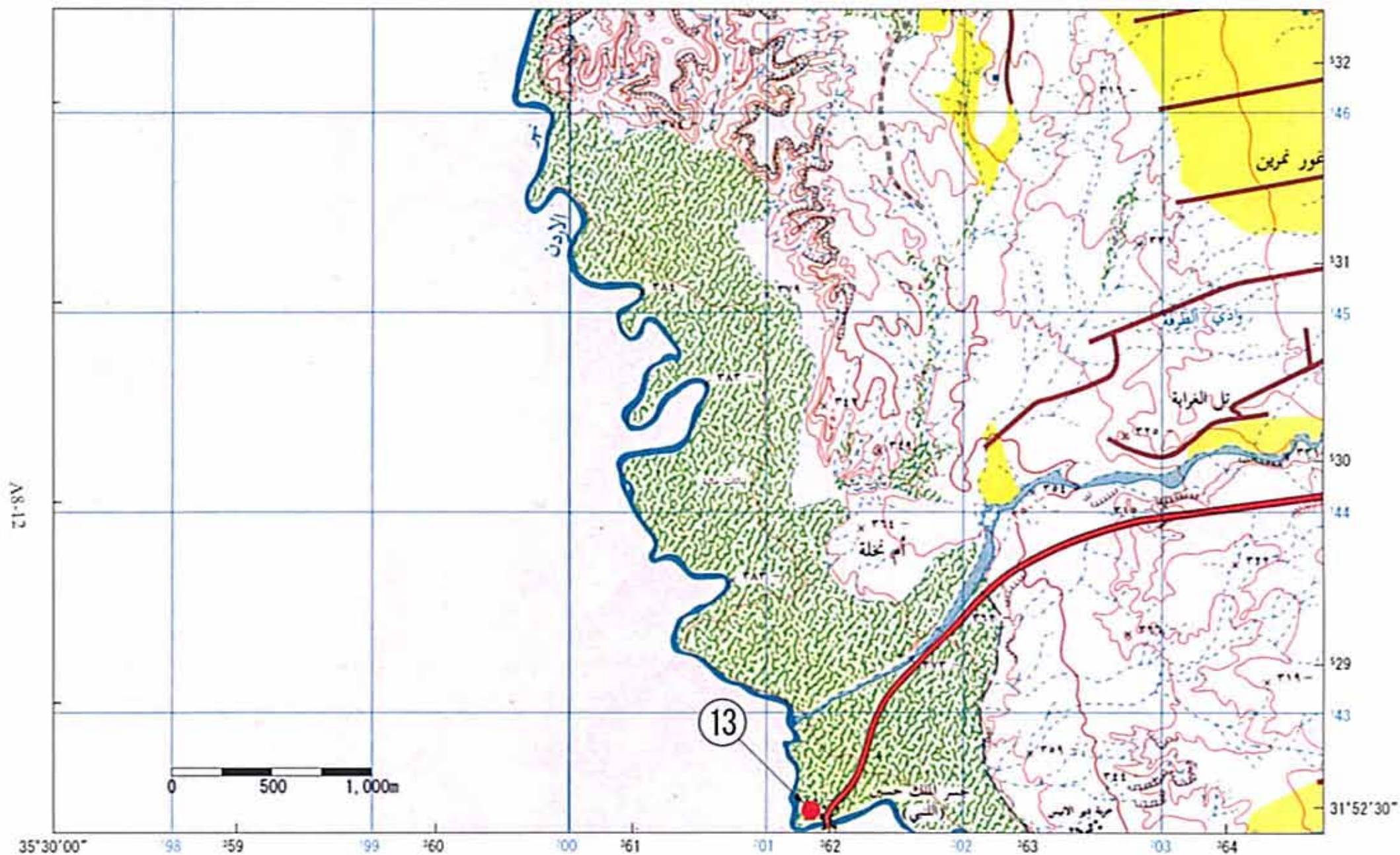
図G-8 ⑨ザルカ川/タワフィンアドワン橋下流



図G-9 ⑩ザルカ川/キングタラールダム上流



図G-10 ⑪ザルカ川/キングタラールダム下流



図G-11 ⑬ ジョルダン川/キングフセイン橋上流