CHAPTER 1

INTRODUCTION

CHAPTER 1 INTRODUCTION

1.1 Background and Objectives

1.1.1 Background

Recommendations for the Master Plan and four priority projects were submitted based on the results of "the study program of Phase III".

The four projects are as shown below:

(1) Groundwater Development and Water Supply in Keshabpur, Jessore District

(2) Chuadanga, Jenaidah and Moheshpur Water Supply Rehabilitation and Expansion

(3) Provision of Arsenic-free Water to Socially Vulnerable Sectors

(4) Establishment of Thana Arsenic Mitigation Promotion Center

The Groundwater Development and Water Supply Plan is the most urgent project of the four priority projects, because the shallow tube wells used for drinking water have been contaminated by arsenic in most rural areas. Therefore, the primary aim of this priority project is to develop safe groundwater for fetching deep groundwater. Keshabpur Thana, Jessore District belongs to the urgent priority area based on the results of an investigation of three hundred existing wells in the three districts. Besides, there is a possibility that safe groundwater for drinking can be obtained by using the deep groundwater in Keshabpur based on the hydrogeological investigations and arsenic concentrations of deep groundwater. It is necessary to perform an accurate FS or pilot study, for instance the experimental use of piped water supply facilities and the establishment of a maintenance system for the piped water supply by village communities to ensure that the priority project is actually continued. However, it was decided that a supplementary survey be conducted instead of a large-scale survey. In the supplementary survey, aquifer tests are performed in the Keshabpur area to determine the capacity of the aquifer. It is necessary to investigate whether the operations and development are sustainable or not for a water supply.

1.1.2 Objectives

The objectives of the supplementary survey are as follows:

(1) To know the circumstances of arsenic contamination in the proposed priority project area(Keshabpur thana) by a survey on all shallow wells.

(2) To know the water supply capacity and permissive water supply quantity based on the results of well drilling and pumping test.

(3) To determine whether there are any maintenance and development organizations for water supply.

(4) To formulate plans for the water supply facility and roughly calculate the maintenance

fee.

1.2 Items

The items of the supplementary survey are as follows:

(1) Screening survey of all shallow tube wells in the survey area and making of well location map (scale: 1: 5,000)

(2) Well drilling and pumping test

(3) Social survey and maintenance organization survey for water supply

(4) Facility plan, standard design of facility, construction fee of rural water supply, and maintenance and development fee.

Figure 1.1.1 shows the rough relationship of the survey items.

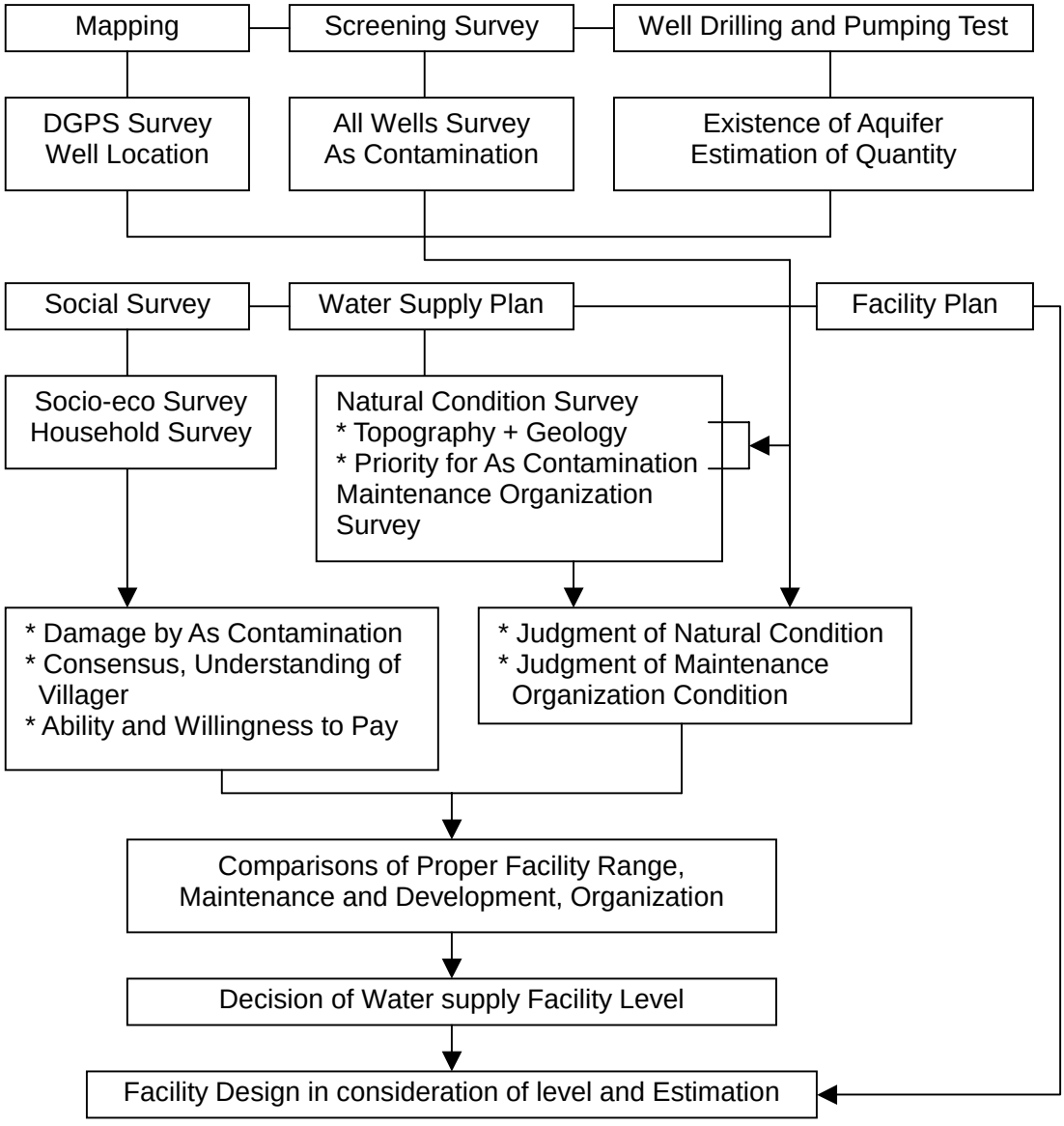


Figure 1.1.1 Relationship among surveys

1.3 Site Selection

Sixty mouzas in Keshabpur Thana were selected at first for the priority project area in order to the high arsenic concentration (more than 0.1mg/l). Then, sixteen mouzas out of the sixty mouzas were selected for the supplementary survey area based on the population, geographic environment, culture and characteristic of the villages.

Table 1.3.1 and Figure 1.3.1 show the Mouza list and location map of the supplementary survey area. Figure 1.3.2 shows the geographic relationship between the 16 and 61 mouzas in Keshabupur thana.

Table 1.3.1 List of 16 Mouza in Keshabpur on Supplementary Survey

NO.	UNION	MOUZA	AREA Km2	POPULATION	DENSITY	CD
①	Keshabpur	Madhyakul	3.0448	2702→3485*	887.4	MD
②	Keshabpur	Ramⅼhandrapur	1.9588	1303→1359	665.2	RH
③	Keshabpur	Habaspol	0.8185	799→1107	976.2	HB
④	Keshabpur	Byasdanga	1.2272	992→1118	808.3	BY
⑤	Keshabpur	Brahmakati	1.4967	1231→1448	822.5	BM
⑥	Keshabpur	Bhagati Narendrapur	3.1694	3096→4153	976.8	BN
⑦	Keshabpur	Maguradanga	1.3425	1142→1303	850.7	MG
⑧	Keshabpur	Khatiakhali	0.7047	648→895	919.5	KK
⑨	Keshabpur	Baliadanga	1.8232	1925→2907	1055.8	BL
⑩	Keshabpur	Kesabpur	0.4184	1000→1512	2390.1	KS
⑪	Keshabpur	Sabdia	1.1650	1013→1720	869.5	SB
⑫	Keshabpur	Altapol	5.0479	6022→8702	1193	AP
⑬	Keshabpur	Sujapur	1.4821	1117→1373	753.7	SP
⑭	Keshabpur	Bajitpur	0.7332	809→1142	1103.4	BJ
⑮	Keshabpur	Sarfabad	0.8016	549→519	684.9	SF
⑯	Panjia	Rajnagar Bankabarsi	2.4255	(1769→1941)	729.3	RB

*Population source: left; 1991, right; 2001
R. Bankabarsi: Estimation from household number

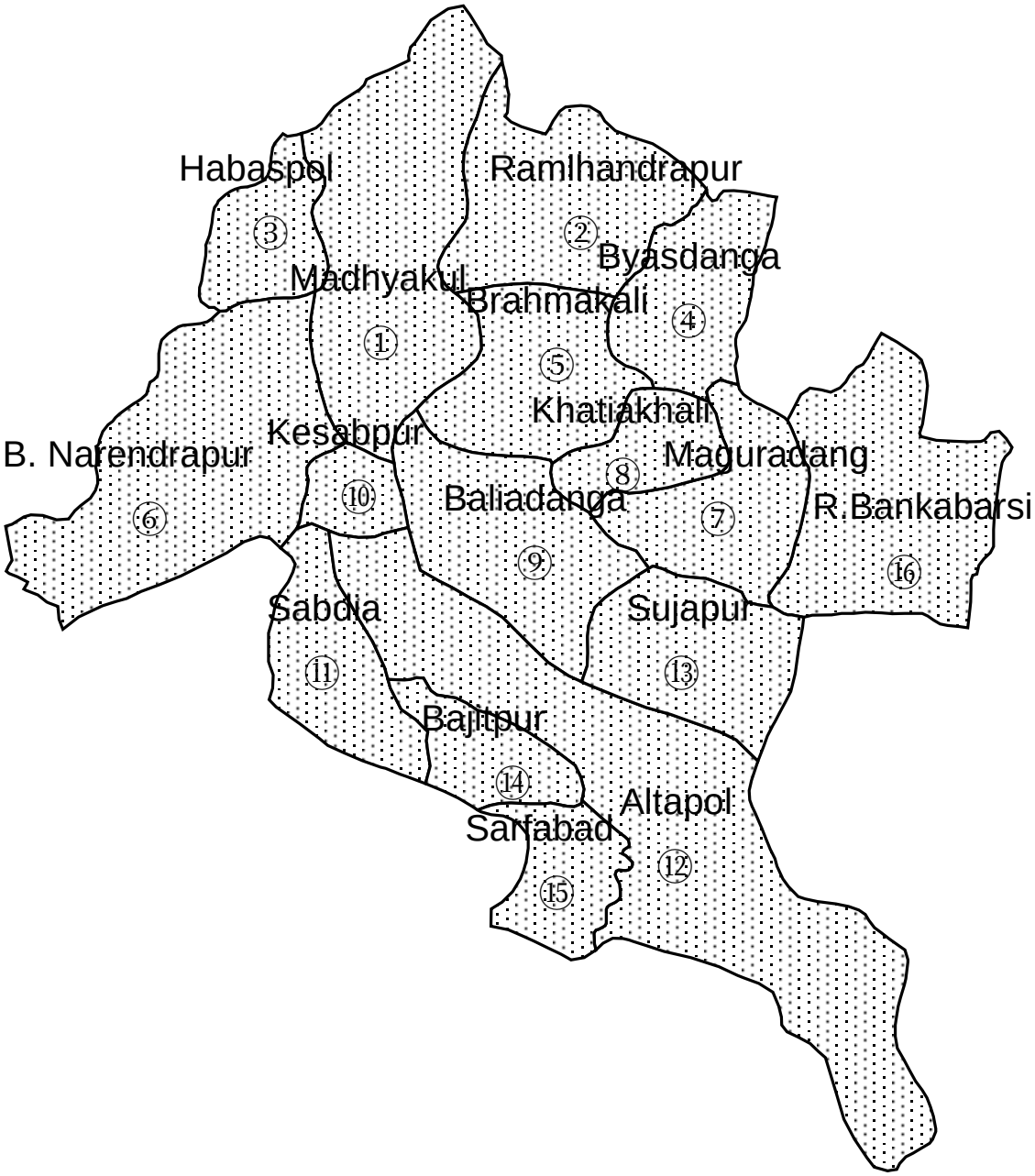
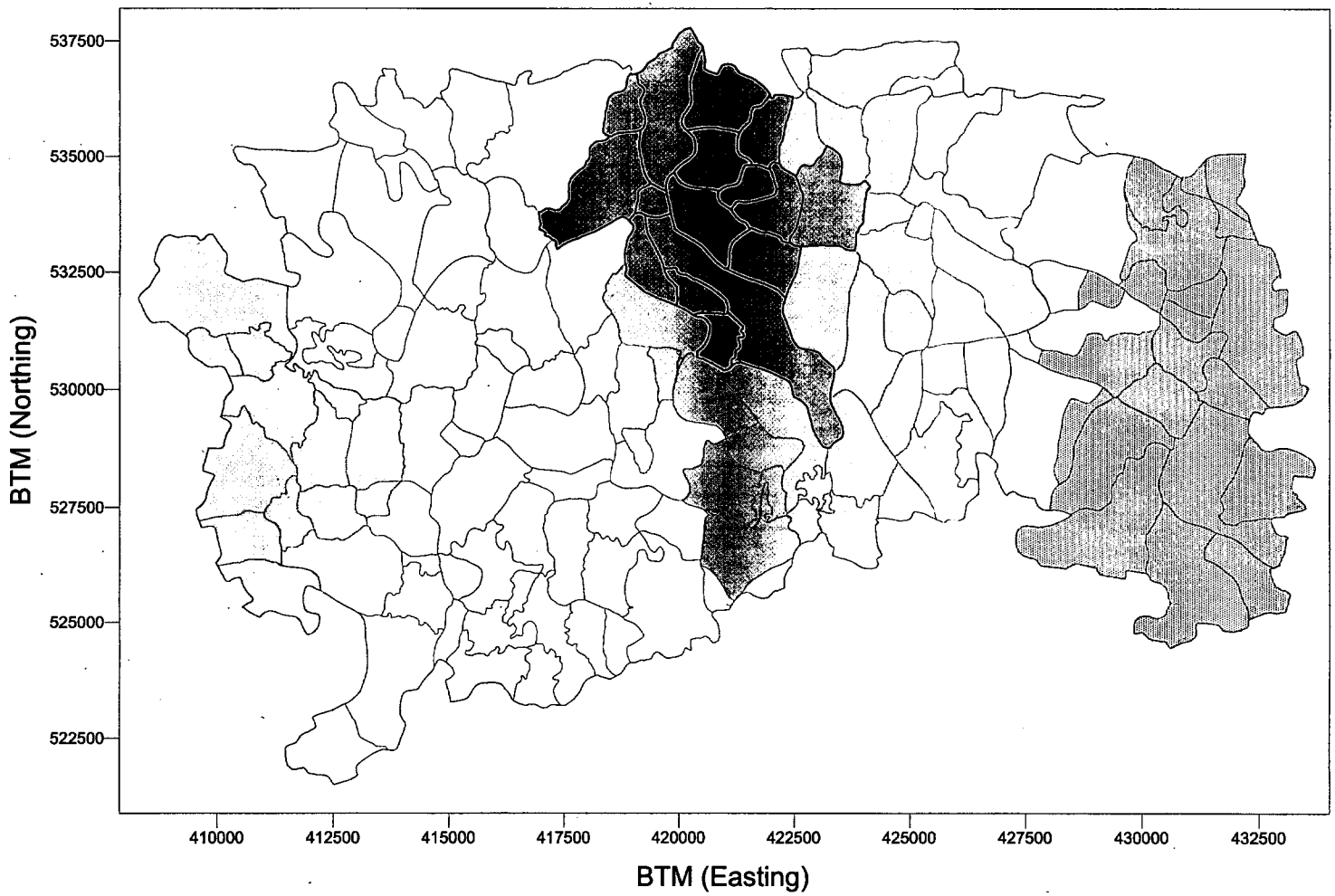
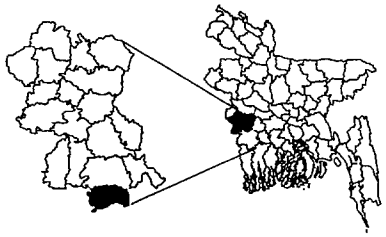


Figure 1.3.1 Location Map of 16 Mouzas





Arcenic level < 0.05 mg/l

0.05 mg/l < As level < 0.1 mg/l

Arcenic level > 0.1 mg/l

Supplymentary Survey Area

Figure 1.3.2 **Location Map of Supplementary Survey Area**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

1.4 Operations and Specialists

Specialists carried out the operations of the supplementary survey in accordance with the items of work.

- Supervisor

  Supervising of all items in the survey and recommendations for all water supply plans.
- Hydrogeology

  Selection of drilling site based on the results of prior investigations. Establishment of casing program by cutting samples observation and geophysical logging data.

  Considerations of hydrogeological structure in the surroundings of the survey area by taking advantage of the survey results.

  Gaining an understanding of the circumstances of arsenic concentration distribution.
- Groundwater quality analysis

  Special guidance on arsenic concentration measurement by FK and another water quality measurements in the field.

  Guidance on the sampling methods.

  Laboratory analysis of arsenic concentration by AAS, and sampling and analysis in the pumping test.
- Mapping

  Surveying by DGPS of the entire survey area and making of map by the GIS.
- Social survey

  Socio-economic study by the results of questionnaire regarding socio-economic and household survey.

  Consideration on sustainability of improved water supply system.
- Water supply plan

  Conclusion of water supply facilities level based on natural conditions in the field, results of maintenance, organization survey, and consideration of socio-economic survey.
- Facility design and estimation

  Design of water supply facilities by water supply plan, estimation of project and each level.
- Project Evaluation (economic and financial plan)

  Evaluations of finance, economy, maintenance, organization, and development; evaluation of effect of countermeasure against arsenic contamination; recommendation on prospect of water supply system in the three districts as well as Keshbpur thana.

CHAPTER 2

MAP CREATION

Supporting Report 2

CHAPTER 2 MAP CREATION

2.1 Necessity

This supplementary survey is similar to the main study involving various components such as a well survey, test well boring, water supply condition survey, socio-economic survey and so on. Most of the components are concerned with geographical information; therefore, a proper map is necessary to express and analyze the results of these surveys. Particularly with the works of facility design for groundwater development as a countermeasure to solve the arsenic problem, the location of wells and other facilities, and the stretch and length of the pipeline can hardly be determined without a proper map.

Screening was adopted as the method for the well survey in the supplementary survey. Just by creating a proper map, it will be possible to clarify the location of wells, so that the survey results can be used not only for calculating the proportion of contaminated wells, but also for creating an arsenic distribution map and for analyzing the relationship between arsenic levels and other factors.

The smoothness of the supplementary survey also largely depends on whether a proper map is available or not. The map can be of great help in checking the survey results, and therefore improvement of the accuracy of the survey can be expected.

On the other hand, maps as well as data from various surveys and analysis, which have been presented by all kinds of thematic maps based on a Base Map, can be expected to play a great role in future studies on the mechanism of arsenic occurrence and movement.

For all the reasons mentioned above, a proper map is quite important for this supplementary survey.

A Base Map has been created in the main survey of this study, by taking the 1: 50,000-scale LGED Thana map as source data (refer to Supporting Report, Volume 1). However, that Base Map was created according to the required scale for the main survey, but not appropriate for the supplementary survey. The supplementary survey was carried out within 16 Mouzas, covering about 28km^2. A map with accuracy as high as several meters is necessary for identifying the location of a lot of wells and for designing the facility. Therefore, a new Base Map (hereafter referred to as “SB”) was created at scale of 1: 5,000, just for the supplementary survey.

2.2 Source Data

In the supplementary survey, the following data was used as data source for SB creation.

- Base Map created in the main survey
- PAN data from IRS
- Mouza Map
- Field measurement

1) Base Map in the Main Survey

In the Base Map, administrative boundaries up to mouza level, main rivers, roads and other themes were contained. The accuracy of the map is mentioned in the Supporting Report, Volume 1.

2) IRS PAN Data

IRS (India Remote sensing Station) has the biggest stock of remote sensing data covering the study area. PAN (Panchromatic Camera) data with an output resolution of 6 m, is the highest quality in IRS. Therefore, Pan data was purchased and used to create a 1: 10,000-scale photo map, to be used as the reference map in the beginning of the supplementary survey for identifying the survey points.

3) Mouza Map

A mouza map was stored in the Settlement Office and ADC（Assistant Deputy Commissioner）Office for land management. The scale of the mouza map is about 1 to 4,000 (16 inch to 1 mile), which can fully meet the needs of the supplementary survey. And for the majority of mouzas, the map was renewed in the 1990s, being the latest one among maps with similar scale.

Land division is the most detailed data in the Mouza map, however, other data like Mouza boundaries, roads, rivers and a part of residential blocks, are also available. Actually, in the well screening survey, the majority of well locations was plotted onto the Mouza map, as well as the recording of addresses and coordinates read by portable GPS.

Out of the 16 surveyed Mouzas, 4 do not have a renewed Mouza map. For these 4 Mouzas, the previous Mouza maps created more than 30 years ago were collected as the reference.

4) Field Measurement

The details of the field measurement are mentioned in the following section.

2.3 Field Measurement

2.3.1 DGPS

The purpose of topographic mapping was to prepare the Base Map (scaled at 1:5,000) covering the Study Area (Approximately 28km², 16 mouzas) in order to provide the positioning database for the **Geographic Information System** (hereinafter referred to as **GIS**). The data of the Base Map was surveyed using **GPS** (Global Positioning System) handheld receivers together with **DGPS** (Differential Global Positioning System) data processing software based on the latest in geodetics and information technology. The Study Team adopted the positioning system because of its accuracy and mobility.

The specifications for the necessary topographical/geographical information measured for the Base Map are summarized below:

- Roads and footpaths
- Landmarks such as schools, mosques/temples, bridges and principal public buildings/compounds
- Rivers and canals
- Notable ponds
- Partial wells (in order to check the position of some wells)
- Control points of geometrical reference for IRS satellite image

2.3.2 Equipment (Hardware and Software)

The main equipment used for the topographic surveying is as below:

- **Hardware for observation of DGPS**
  Geo Explorer 3 (Trimble, made in USA): 3 sets
- **Software for data processing and drawing**
  GPS Pathfinder Office (Trimble, made in USA): 1 set
  AX Cosmos Windows Version 2.1 (Uto Kogyo, made in Japan): 1 set
  Auto CAD LT 2000 (Autodesk, made in USA): 1 set
  Arc View GIS 3.2 (Esri, made in USA): 1 set

2.3.3 Summary of DGPS Theory

A GPS is one of the latest technologies that use a satellite positioning system. It can obtain the geographical coordinates (Latitude/Longitude) as well as the horizontal rectangular coordinates (Northing/Easting as in UTM and other coordinate systems) anywhere in the world. The theory of the GPS is based on geometrical theory and the latest electronic technology and it can accurately measure the distance between the GPS receiver and GPS satellites. The satellite sends a wireless code and the GPS receiver simultaneously generates the same wireless code.

The receiver can accurately measure the travel time by comparing the time difference between the two codes. The distance can then be calculated by multiplying that travel time by the speed of light (approx. 300,000 km per second). Moreover, if the GPS receiver gets signals from four (4) or more satellites, it can determine a 3D position (longitude, latitude and altitude).

Therefore, it is possible to accurately calculate the distance between two (2) positions on the ground.

Generally, GPS surveying (e.g. precise positioning by ground control surveying, such as topographic surveying) is carried out by the DGPS method using two (2) or more GPS receivers. It can obtain data with higher accuracy than the single positioning method using one (1) GPS receiver, because the distance/direction between the two (2) stations are corrected differentially.

2.3.4 Coordinates System

Fundamentally, the following coordinates system for the topographic mapping was applied in accordance with the National Coordinates System of Bangladesh (BTM: Bangladesh Transverse Mercator).

- Datum of Longitude/Latitude in Bangladesh:

  Longitude: 90o24’ 56.34024”

  Latitude: 23o47’ 52.02714”
- Central meridian: 90 degree on longitude east
- False Easting: +500,000 meter
- False Northing: -2,000,000 meter from equator
- Geodetic System and Ellipsoid: WGS 84 (World Geodetic System 84)
- Scale Factor: 0.9996 on central meridian

2.3.5 Base Station of DGPS

The Base Station of the DGPS was established in the Study Area on the rooftop of a building that was located in a suitable place for GPS observation by the Study Team.

The following are the Base Station’s geographical coordinates (longitude/latitude), observed by the single positioning method using the Geo Explorer 3.

Longitude: 89o13’ 11.576”

Latitude: 22o54’ 32.734”

The coordinates (Northing/Easting) of the Base Station were fixed by the following average values during the whole DGPS observation. The values were the referenced coordinates for differential positioning (DGPS) between the Base Station and the Mobile Stations by the coordinates system based on the BTM.

Easting: 420,281.44 meter

Northing: 533,396.56 meter

The data logging time was established at intervals of 15 seconds.

2.3.6 Mobile Stations of DGPS

Prior to the measurement of the Mobile Stations, the data files (data dictionary) containing the attributes of the features prepared in the Pathfinder were downloaded to the Geo Explorer 3.

After installing one (1) receiver at the Base Station, the Mobile Stations of the two (2) receivers were used on foot and/or by vehicle for the topographic mapping of the 16 mouzas in the Study Area. The coordinates (Northing/Easting) of each of the said topographical/geographical features were corrected differentially after they was downloaded from the GPS receivers (Geo Explorer 3) to the GPS Software (Pathfinder). This data file was converted from the GPS Software to a **DXF** file through the Auto CAD from the GPS Software, and it was compiled by using the CAD Software (AX Cosmos).

As a rule, the data type measured by the mobile stations is as below:

Table 2.3.1 Data Type of the Topographical /Geographical Features

Classifications	Data Type	Remarks
Roads and footpaths	Line	
Landmarks (schools, mosques and others)	Point/area/line	
Rivers and canals	Line	
Notable ponds	Area/line	
Partial wells	Point	
Control points for geometrical reference	Point	The installed 10 points

The data logging time was installed at intervals of 2 seconds and/or 5 seconds.

2.3.7 Accuracy of DGPS

The positioning accuracy of DGPS is approximately **1.0 to 5.0 meters** (standard deviation) by differential corrections, under the condition that messages are received from more than 4 satellites at a **PDOP*** of less than 6, and errors due to **Multipathing****are avoided.

(Notes)

* Position Dilution of Precision; The index number that indicates the positioning accuracy of the geometric position of the satellites and the user on the ground (satellite geometry).

** When something, such as a building or the ground interferes (i.e. reflects) with reception of a signal from a satellite causing a positioning error.

2.4 Data Processing

The data file conversion and the compiling of a drawing that occurs in data processing was carried out based on the workflow below.

File Extension	Data Processing
SSF	Raw positioning data received by Geo Explorer 3
COR	Positioning data corrected differentially on Pathfinder
DXF(1)	Converted to DXF on Pathfinder and then exported to Auto CAD
DXF(2)	The data that was compiled after importing the DXF file (1) on the Auto CAD by AX Cosmos Windows 2.1
SHP	Imported DXF (2) on Arc View GIS 3.2 and then converted to SHP

Figure 2.4.1 Workflow of Data Processing

2.5 Result of Map Creation

Based on the source data and processing mentioned in the above sections, a 1: 5,000-scale SB was created in the supplementary survey. The SB consists of the following themes contained in the supplementary survey database.

2.5.1 Theme on Natural Features

1) Rivers and Ponds

The only theme contained in the supplementary database for natural features. Several rivers flowing in the supplementary survey area from northwest to southeast. The river file was created based on field measurement results.

There is no large body of water like a lake; however, many ponds are distributed in the supplementary survey area. The pond file used the field measurement results as the main data source, supplemented by the Mouza map, records from reconnaissance, well screening survey, and so on.

2.5.2 Theme on Socio-economic Feature

1) Mouza Boundary

The Mouza boundary file was created by digitizing the Mouza map.

Since the Mouza map does not contain coordinates, when integrating the digitized results onto the SB database, georeferencing was performed using control points selected from the main road in the field measurement results and the Base Map in the main survey.

The attribute data of the results summarized in Mouza unit (i.e. area, population, results of screening, and so on) was attached to the Mouza boundary file.

2) Road Map

The road file was created using the same data source and the same processing as the pond file. The attribute data divide the road into main and small roads.

3) Residential Block

The data source and processing for this file is also the same as the pond file.

4) Landmark

The landmark file can be divided into a polygon file and a polyline file to give the location and type of landmarks such as school, factory, office, mosque, shop, and so on.

5) Socio-economic Survey Result

A point file was created to show the location of visited households. A part of the socio-economic survey results was attached to the file, such as household size, water utility condition, and so on.

6) Well Survey Result

The file consists of two point files, an irrigation well file and domestic water supply well file. For irrigation wells, attribute data includes depth and arsenic measurement results. For domestic water supply wells, which are the main subject of the well screening survey, attribute data includes not only depth and arsenic measurement results, but also results on other water quality parameters and relevant data like construction year, owner classification, and so on.

CHAPTER 3

SCREENING SURVEY

Supporting Report 2

CHAPTER 3 SCREENING SURVEY

3.1 Survey Items and Method

All existing wells for domestic use in 16 mouzas were the object of the screening survey. The following items were investigated for each well using the survey sheets prepared by the Study Team.

3.1.1 Survey Items

The items were (1) groundwater quality and (2) other items. The groundwater quality including arsenic was tested in the field. The parameters tested in the field and their methods are shown below:

(1) Arsenic (AAN Field Kit)
(2) pH (potable pH meter)
(3) Oxidation-reduction potential, ORP (potable ORP meter)
(4) Electric conductivity, EC (potable EC meter) with temperature

The other items are well structure and conditions of the existing wells. The results of the survey were recorded with the groundwater quality on the survey sheets. The items and survey methods are as follows (F: field survey, H: hearing, R: existing record).

(1) Survey date, time, and climate (F)
(2) Team and members' names
(3) Mouza and village name, and JL number of the well location (H, R)
(4) Owner's name, address, house number (H, R)
(5) Well depth and drilling date (H, R)
(6) GPS investigation (F)
(7) Drawing sketch map of well location
(8) Taking photographs (long distance)

3.1.2 Survey Method

The measurements of groundwater quality in the field were carried out by the method of the Standard Operation Procedure (SOP) for the field work standards. Figures 3.1.1 to 3.1.4 show the flowcharts of SOP. The survey items were filled in the field survey sheet (see the original sheet of Figure 3.1.5).

Since a large number of wells were investigated in the field, specialists of water quality (chemist) paid attention to the quality of bromide paper and chemicals in the measurement. In case the reactions of paper didn't become clear, chemists changed the paper or chemicals

rapidly.

During the field screening survey in 16 mouzas, groundwater samples from the existing wells were collected for the arsenic analysis by the AAS in Jhenaidah Laboratory because of the comparison of FK and AAS. The amount of sampling was approximately more than 10% of almost all the wells in 16 mouzas. If low arsenic concentrations by FK were found during the screening survey in the field, these groundwater samples were collected in addition to the 10% samples for the arsenic analysis by the AAS in the laboratory. Before starting the screening survey, fieldwork procedures are as follows:

(1) Greet and explain the purpose, survey area and method of this supplemental survey to the Thana executive officer (TON), UP chairman and Mouza representative.
(2) Explain it to the well owner
(3) Measure the GPS coordinates by the portable GPS meter. GPS measurements were carried out upon arriving at the well points, during measurement of FK, and before going to another well point.
(4) Pump by hand pump for ten minutes
(5) Measure groundwater quality by the FK and EC, ORP, and pH potable meter
(6) Sample groundwater (one sample per ten wells)
(7) Fill in the survey sheets by field survey, interviews or existing records and making a sketch map.
(8) Plot the points of the well on the map.
(9) Take a photo of the wells.
(10) Explain the screening results to the well owner.
(11) Paint the well the appropriate color and mark a well number on it with permission of the well owner.

Photo1: Training of screening survey

Photo2: FK measurement in the field

Photo: Mapping in field survey

Photo: Numbering and Painting of Well

SOP for AAN As test kit

SOP written by _____

Dated _____

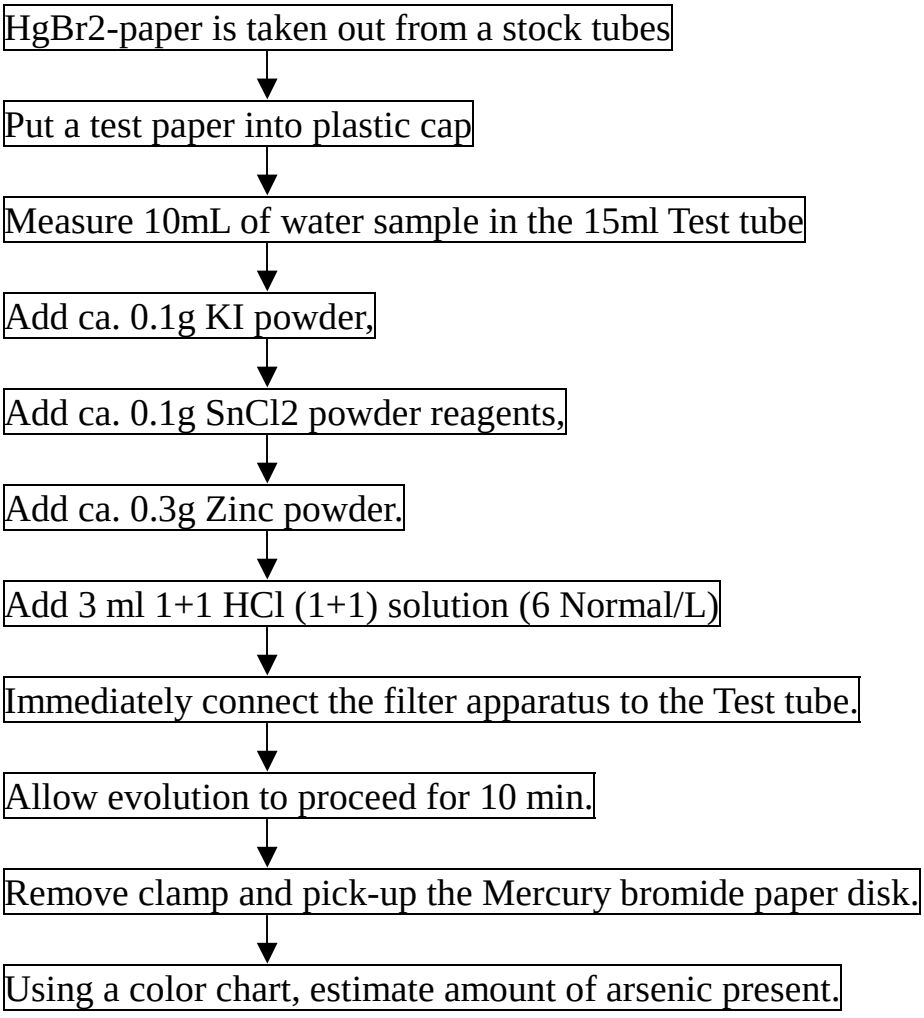


Figure 3.1.1 SOP for AAN As test kit

SOP for ORP meter

SOP written by _____

Dated _____

.

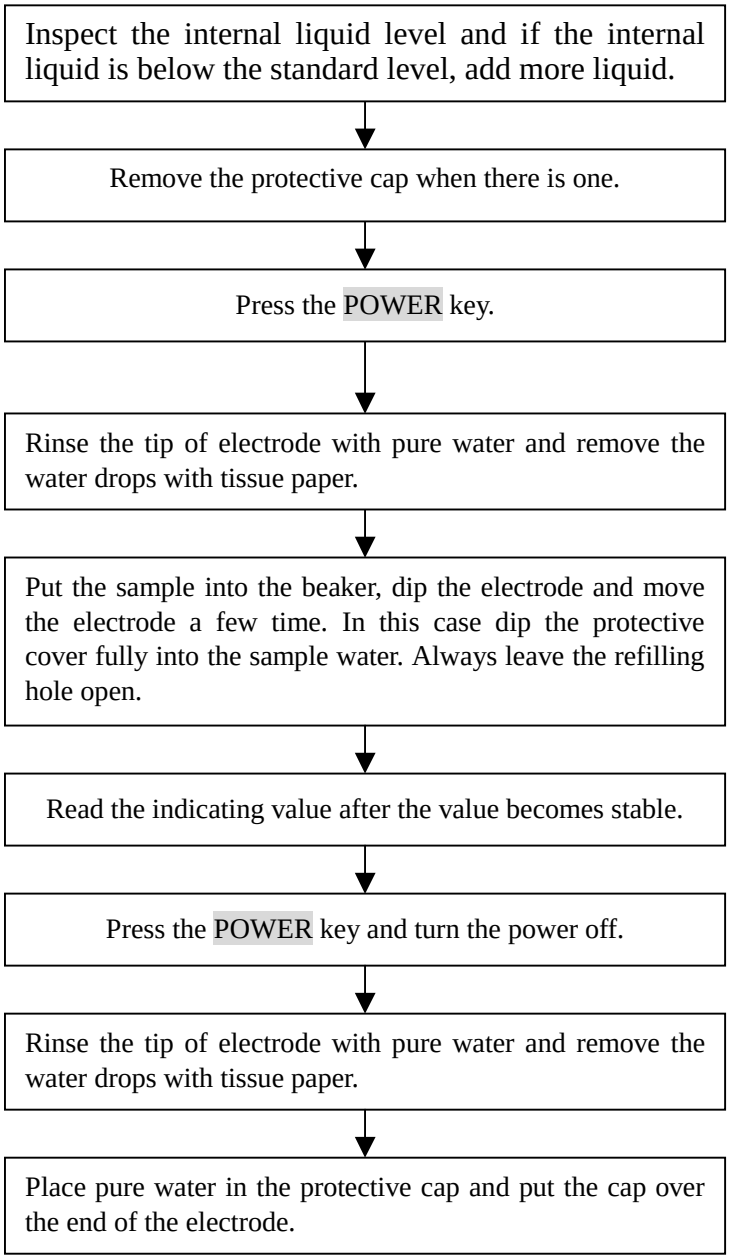


Figure 3.1.2 SOP for ORP meter

SOP for pH meter

SOP written by _____

Dated _____

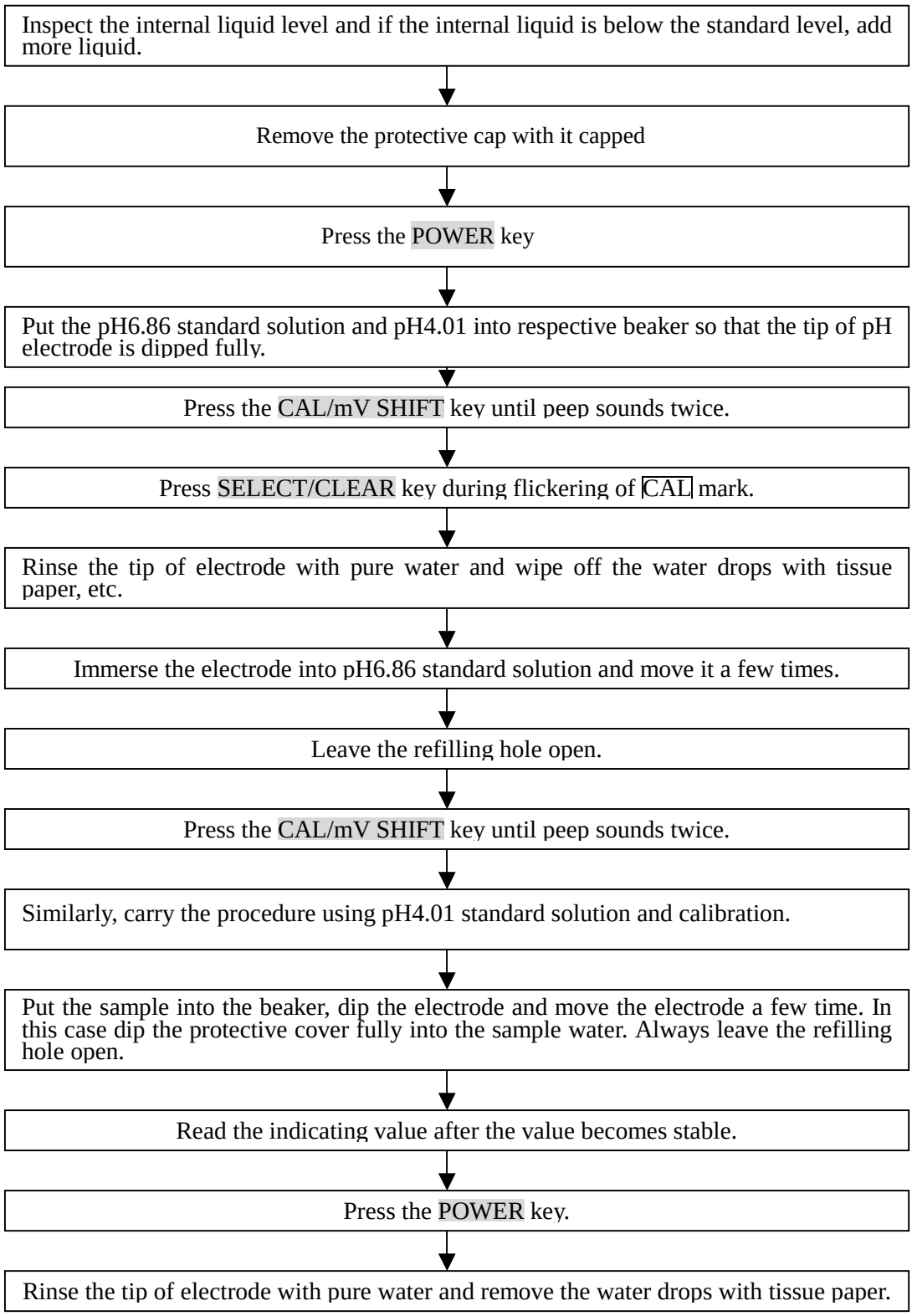


Figure 3.1.3 SOP for pH meter

SOP for EC meter

SOP written by _____

Dated _____

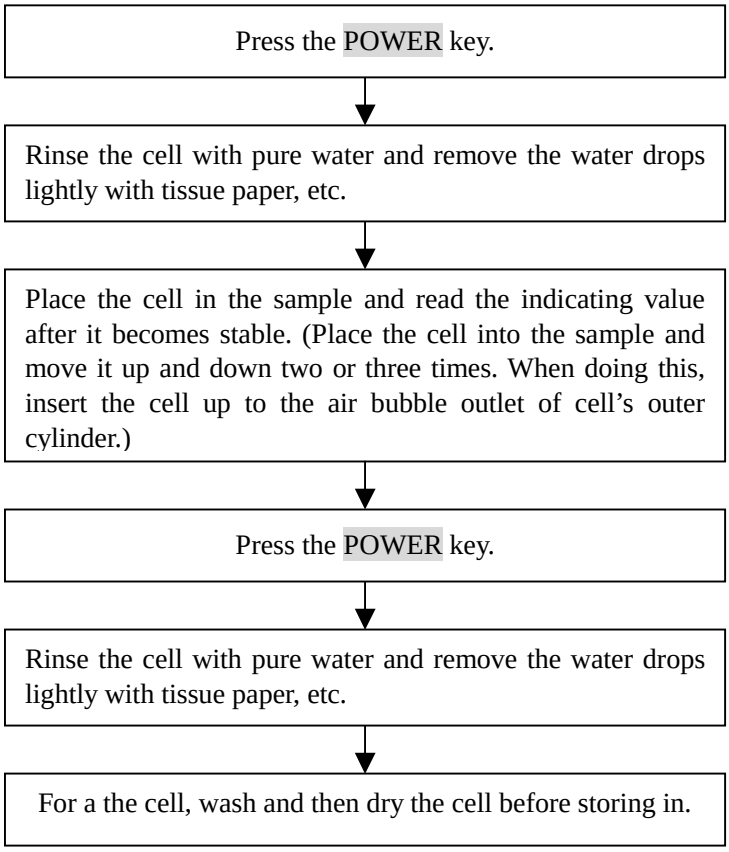


Figure 3.1.4 SOP for EC meter

Date :		Time :		Well No:	
Team No :		Weather :			
Investigator :					
Mouza :			Village :		JL No :
Latitude :	N		Longitude:	E	
:	N		:	E	
:	N		:	E	
(UTM) :	N		(UTM) :	E	
:	N		:	E	
:	N		:	E	
Land Owner:					(House No :)
Depth:	ft・m	(R・H・M)			*R:record H:Hearing M:measure*
Drlling Date:			(y.B.P)		(R・H)
EC:	mS/m		As (FK)		mg/l
pH:			unknown 1 2 3 4 5 6		mg/l
ORP	mV		Colored disk paper attach here		
Water Temp.:	℃		sampling:(yes : no)		
Sketch of well Location and Note					
					Not to Scale

Figure 3.1.5 (1) Field survey sheet in screening

(Well Photograph)

Date :	Time :	Well No :	
Photo (Wide)	*F.No* *S.No*		

Figure 3.1.5 (2) Field survey sheet in screening

3.2 Results

The results of the screening survey include the location map of the wells, the survey sheets with the specified well information and the groundwater quality including As, pH, ORP, EC, and water temperatures. Table 3.2.1 to 3.2.15 show the summary of screening survey in each mouza.

3.2.1 Fundamental Works of Well Location Map

Chapter 2 showed the procedure for making the base map of the well locations. This base map was made for the first time in Bangladesh without using aerial photographs. The base map was made by DGPS surveying. First of all, before DGPS surveying, a hand-made map was prepared by geologists on a piece of graph paper to show the landmarks, for example the school, small shops, temples and so on, as accurately as possible. This hand-made map is similar to the route map, which was made for a general geological survey. The Mouza maps were detailed in Bangladesh and were most useful along with the hand-made map to carry out the DGPS surveying. They were old, made in approximately 1914, and we obtained the Mouza maps in 1988. A part of the Mouza map is shown below in Figure 3.2.1.

Figure 3.2.1 A part of the Mouza map

3.2.2 Number of Wells and Well Depth

Figure 3.2.2 and Table 3.2.16 show the number of wells surveyed a day during the screening survey. The survey party consisted of two persons and five parties were formed during the screening survey. We investigated 10 to 140 wells a day in total, and according to the frequency distribution of the number of wells surveyed a day, the most frequent number of wells surveyed a day was from 60 to 80. The number of wells that we investigated depended on the density of wells and the more time we needed to move for checking well location, the more the number of wells we investigated a day decreased. Figure 3.2.3 shows the number of wells in each mouza. Altapol Mouza has 911 wells (see Table 3.2.17). This is the largest number of wells in a single mouza. As for the results of the screening survey, all surveyed wells in the 16 mouzas totaled 3,037 (three thousands thirty seven) wells (supplementary survey 2,963+R.Bankabarsi 74).

Table 3.2.16 Number of wells surveyed a day and total wells

DATE	Group 1	Group 2	Group 3	Group 4	Group 5	Total
1/15/2002	RH (9)	RH (12)	RH (11)	RH (10)	RH (8)	50 (50)
1/16(Wed)	RH (5)	—	—	RH (13)	—	18 (68)
1/17(Thu)	BM (10)	BY (13)	BY (19)	RH (20)	BM (15)	77 (145)
1/18(Fri)	BM (12)	BY (6)	BY (8)	RH (26)	BM (17)	69 (214)
1/19(Sat)	BM (14)	MG (10)	KK (16)	MG (7)	BM (12)	59 (273)
1/20(Sun)	RH(6)+BM13	MG (13)	KK (11)	MG (14)	BM (15)	72 (345)
1/21(Mon)	BL (10)	MG (8)	KK (13)	—	BL (11)	42 (387)
1/22(Tue)	BL (10)	SP (10)	KK (13)	MG (15)	BL (12)	60 (447)
1/23(Wed)	BL (16)	SP (16)	KK (11)	MG (14)	BL (20)	77 (524)
1/24(Thu)	BL (21)	SP (15)	SF (4)	MG (8)	BL (18)	66 (590)
1/25(Fri)	Holiday	Holiday	Holiday	Holiday	Holiday	—
1/26(Sat)	BL (20)	SP (16)	SF (14)	BJ (13)	BL (22)	85 (675)
1/27(Sun)	BL (15)	SP (16)	SF (16)	BJ (13)	BL (17)	77 (752)
1/28(Mon)	—	SP (3)	SF (13)	BJ (9)	BL (15)	40 (792)
1/29(Tue)	BL (20)	SP (15)	SF (2)	BJ (15)	BL (9)	61 (853)
1/30(Wed)	BL (15)	SP(9)+BN(8)	SB (18)	BJ (21)	another	71 (924)
1/31(Thu)	BL (8)	—	SB (10)	MD (8)	BN (18)	44 (968)
2/1(Fri)	BL (16)	BN (21)	SB (17)	MD (20)	BN (18)	92 (1060)
2/2(Sat)	BL (18)	BN (14)	SB (25)	MD (28)	BN (9)	94 (1154)
2/3(Sun)	BL (5)	BN (20)	SB (23)	MD (8)	BN (20)	76 (1230)
2/4(Mon)	HB (18)	KS(10)+BN2	SB (24)	MD (16)	BN (20)	90 (1320)
2/5(Tue)	HB (20)	KS (27)	SB (23)	MD (21)	BN (22)	113(1433)
2/6(Wed)	HB (18)	KS (21)	SB (13)	MD (16)	—	68 (1501)
2/7(Thu)	AP (15)	KS (24)	SB (27)	MD (16)	BN (21)	103(1604)
2/8(Fri)	Holiday	Holiday	SB (10)	Holiday	Holiday	10 (1614)
2/9(Sat)	Dhaka	KS (21)	AP (17)	Dhaka	Dhaka	38 (1652)
2/10(Sun)	BL (2)	KS (19)	AP (18)	MD (26)	BL (2)	67 (1719)
2/11(Mon)	AP (20)	KS (3)	SB (3)	MD (17)	BN (21)	63 (1782)
2/12(Tue)	AP (12)	KS (21)	AP (21)	MD (18)	BN (21)	93 (1875)
2/13(Wed)	Holiday	KS (30)	AP (24)	MD (25)	BN (29)	108 (1983)
2/14(Thu)	AP(15) +RH(2)	KS (24) +BY (1)	AP (31) +KK (2)	MD (28)	BN(21)+B M(1)+BL(1)	126 (2109)
2/15(Fri)	AP (19)	—	—	—	BN (35)	54 (2163)
2/16(Sat)	AP (32)	KS (23)	AP (24)	MD (6)	BN (18)	103 (2266)
2/17(Sun)	AP (34)	—	AP (20)	AP (29)	BN (19)	102 (2368)
2/18(Mon)	AP (15)	—	AP (8)	AP (13)	—	36 (2404)
2/19(Tue)	Eid Holiday	Eid Holiday	Eid	Eid	Eid	Eid
2/20(Wed)	Eid	Eid	Eid	Eid	Eid	Eid
2/21(Thu)	Eid	Eid	Eid	Eid	Eid	Eid
2/22(Fri)	Eid	Eid	Eid	Eid	Eid	Eid
2/23(Sat)	Eid	Eid	Eid	Eid	Eid	Eid
2/24(Sun)	Eid	Eid	Eid	Eid	Eid	Eid
2/25(Mon)	Eid	Eid	Eid	Eid	Eid	Eid
2/26(Tue)	Eid	Eid	Eid	Eid	Eid	Eid
2/27(Wed)	—	—	AP (20)	AP (23)	BN (10)	53 (2457)
2/28(Thu)	—	—	AP (17) +SF (1)	AP(39) +BJ(1)	AP (40)	98 (2555)
3/1 (Fri)	AP (34)	—	AP (25)	AP (41)	AP (40)	140 (2695)
3/2 (Sat)	AP (19)	—	AP (28)	AP (52)	AP (14)	113 (2808)
3/3 (Sun)	AP (14)	AP (33)	AP (28)	AP (15)	—	90 (2898)
3/4 (Mon)	—	AP (33) + Ks (3)	—	AP (29)	—	65 (2963)

[Mouza code]
Ramlhandrapur:RH, Byasdanga:BY, Brahmakati:BM, Khatiakhali:KK,
Maguradanga:MG, Baliadanga:BL, Sujapur:SP, Altapol:AP,
Sarfabad:SF, Bajitpur:BJ, Sabdia:SB, Kesabpur:KS, Madhyakul:MD
Habaspol:HB, Bhagati Narendrapur:BN, Rajinagar Bankabarsi:RB

Table 3.2.17 Number of wells in each mouza

NO.	UNION	MOUZA	CODE	Number of wells
1	Keshabpur	Madhyakul	MD	253
2	Keshabpur	Ram|handrapur	RH	122
3	Keshabpur	Habaspol	HB	56
4	Keshabpur	Byasdanga	BY	47
5	Keshabpur	Brahmakati	BM	109
6	Keshabpur	Bhagati Narendrapur	BN	367
7	Keshabpur	Maguradanga	MG	89
8	Keshabpur	Khatiakhali	KK	66
9	Keshabpur	Baliadanga	BL	303
10	Keshabpur	Kesabpur	KS	226
11	Keshabpur	Sabdia	SB	192
12	Keshabpur	Altapol	AP	911
13	Keshabpur	Sujapur	SP	100
14	Keshabpur	Bajitpur	BJ	72
15	Keshabpur	Sarfabad	SF	50
16	Panjia	Rajnagar Bankabarsi	RB	74

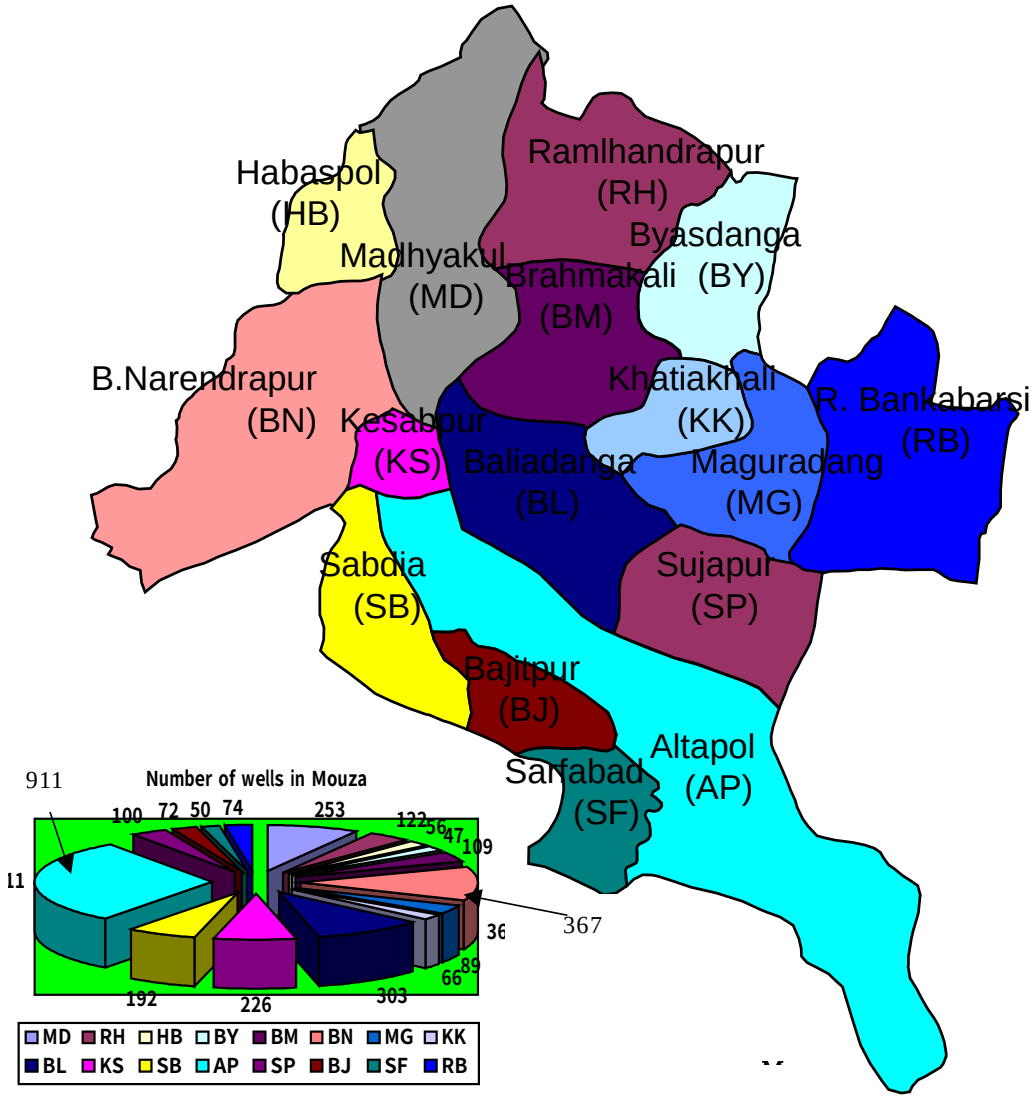


Figure 3.2.3 Number of Wells in Each Mouzas

As stated below, chapter five provides the data on the population and area of the 16 mouzas. Figure 3.2.4 shows well density to area based on the data in chapter 5. Kesabpur has the highest density compared with the other mouzas. Altapol, Sabdia, and Baliadanga also have a high density of wells. The well densities of Altapol and Sabdia are of similar degree. The number of wells and population in Altapol are actually concentrated in the northwest area. Kesabpur, the northern part of Altapol, Sabdia and Baliadanga belong to Keshabpur Pourashaba. Figure 3.2.5 shows well density to population (100 persons). Figure 3.2.5 has a similar illustration as Figure 3.2.4. Kesabpur has the highest density of wells to population. The mouzas that belong to the Pourashaba indicate a high density compared to rural areas; Ramlhandrapur is only rural area with a high density. Figure 3.2.6 shows the well depth in the 16 mouzas. Dozens of wells are from 40 to 60m in depth in the 16 mouza except B. Narendrapur, Sarfabad, and Sabdia. B. Narendrapur, Sarfabad and Sabdia have many wells from 20 to 40m in depth, particularly in B. Narendrapur, where wells of this depth make up a large proportion (about 70%) of wells. The

groundwater taken from 20 to 40m in depth have a low arsenic concentration of less than 0.1mg/l. Half the number of wells in R. Bankabarsi are from 60 to 80m in depth. Tube wells more than 60m deep belong to the government and public organizations. Figure 3.2.7 shows the drilling date of the wells. A large number of wells were set up between 1996 and 2000. The number of wells tends to increase from 1986 in the Pourashaba area. Figure 3.2.8 shows the well owner. Most wells belong to a private owner. DPHE, schools, mosques and another public organizations have a few wells.

3.2.3 Arsenic Analysis by Field Kit

The AAN Field Kit is used to know the rough arsenic concentration in the field.

1) Shallow Tube Wells

Figure 3.2.9 shows the arsenic concentration map at well points in the 16 mouzas. Almost all of the wells illustrate values of more than 0.2mg/l of arsenic. Values of more than 0.2mg/l seem to range along the river of the direction from northwest to southeast. Values showing more than 0.5mg/l are widely distributed from the center part to the north area of the 16 mouzas. Values indicating more than 0.7mg/l are dotted in R. Bankabalsi and the northern part of the survey area. Arsenic concentrations indicate values of less than 0.1mg/l at the edge of the west and southeast part of the survey area. The values showing less than 0.01mg/l are also dotted in the same area, indicating less than 0.1mg/l. Figure 3.2.10 shows the arsenic concentration contour map by FK. The arsenic concentrations of groundwater were measured at 3,037 exiting wells including R. Bankabalsi wells. On the whole, the high arsenic concentrations values (more than 0.5mg/l) are distributed in most of the areas in the survey area. On the other hand, the low arsenic concentrations are dotted in the west of the survey area. Especially, arsenic concentrations indicate values of less than 0.1mg/l, including less than 0.05mg/l, at the edge of the western and southeastern part of the survey area and a part of R. Bankabarsi. Figure 3.2.11 shows bar charts of a histogram on arsenic concentrations by FK in each mouzas. The arsenic concentration in almost all of the wells show more than 0.1mg/l. As concentrations indicating from 0.01 to 0.05mg/l are in B. Narendrapur and a part of Altapol clearly. Figure 3.2.12 shows an arsenic concentration contour map by AAS. Sampling was carried out taking samples of 379 existing wells for measurement by AAS at the Laboratory. Most samples indicate values from 0.2 to 0.5mg/l. On the other hand, arsenic concentrations showing values of less than 0.1mg/l, including less than 0.05mg/l, are seen in the west and southeast along the western boundary of the survey area. The distribution of arsenic concentrations by AAS is similar to that by FK. Arsenic concentrations in R. Bankabarsi by AAS are data from 2001. The values indicating more than 0.5mg/l are seen in the center of Bnakabalsi mouza. Figure 3.2.13 shows bar charts of a histogram on arsenic concentrations by AAS in each mouzas. Arsenic concentrations in almost

all of wells ahow more than 0.1mg/l. Arsenic concentrations from 0.01 to 0.05mg/l are in B. Narendrapur and a part of Altapol. Figure 3.2.13 is similar to Figure 3.2.11.

2) Irrigation Wells

Figure 3.2.14 shows an arsenic concentration contour map of 37 existing irrigation wells by FK. Arsenic concentrations have values of more than 0.2mg/l in most areas. Besides, the areas indicating arsenic concentrations of more than 0.5mg/l are seen in the north and east in the survey area. On the other hand, arsenic concentrations show values of less than 0.1mg/l, including less than 0.05mg/l, at the edge of the west and southeast in survey area. The results of Figure 3.2.14 correspond to the distribution of the arsenic concentration in shallow tube wells.

3.2.4 Groundwater Quality

1) pH

Figure 3.2.15 shows bar charts of a histogram on pH values measured at shallow tube wells in the survey area. The most frequent pH values are about 7.0 to 7.2 in pH in most of the mouzas. Besides, the most frequent pH value is more than 7.2 in pH in B. Narendrapur, Kesabpur, Madhyakul and Byasdanga. On the other hand, the most frequent pH values are less than 6.8 in pH in Baliadanga, and 6.8 to 7.0 in pH in Altapol. Therefore slightly acidic groundwater mainly exists in survey area.

2) Oxidation-Reduction Potential (Eh)

The oxidation-reduction potential is one of the most important parameters to express the groundwater environment. The oxidation-reduction potential was measured by portable ORP meters in the field. The reading value of the ORP meter shows an apparent value of oxidation-reduction potential including the potential difference of the platinum electrode. Therefore, corrections of reading values are needed to obtain the true oxidation-reduction potential (Eh) values. Equation (3.2.1) is used for the correction:

$$Eh = ORP - 0.71978 \times Temp + 224.363 \qquad (3.2.1)$$

where, *Eh* is the corrected oxidation-reduction potential (mV), *ORP* is the reading value of the ORP meter using the platinum electrode (mV), *Temp* is the water temperature (°C). Figure 3.2.16 shows bar charts of a histogram on Eh values measured at shallow tube wells in the survey.

The most frequent Eh values are about 50-150mV in the most mouzas. The Eh values slightly more frequent than the others is less than o mV in Sujapur and Maguradamga.

3) Electric Conductivity (EC)

Figure 3.2.17 shows bar charts of a histogram on EC values at shallow tube wells in the survey

area. Figure 3.2.18 shows the contour map of EC values in the 16 mouzas. The river is running in the center of survey area from northwest to southeast. There is a difference in EC values between the southwest and northeast of the river. The most frequent EC values are less than 100mS/m in B. Narendrapur, Kesabpur, Sabdia, Bajitpur, Sarfabad and Altapol along the river. On the other hand, the most frequent EC values show more than 100mS/m or near 150mS/m in the northeast area of the 16 mouzas. EC values of existing 300 wells in 2001 indicated less than about 100mS/m in Chuadanga, Jhenaidah and Jessore Districts. Therefore EC values in the northeast of the survey area have probably been affected by saline groundwater.

4) Eh-pH-As Relationship

Figure 3.2.19 shows the relationship among Eh, pH and arsenic concentrations in almost all wells. Most of the contaminated samples having more than 0.1mg/l of arsenic are plotted in a zone with 7 to 7.5 in pH and 50 to 120mV in Eh.

3.2.5 Comparison of FK and AAS

In the Screening Survey, arsenic concentrations of all tube well groundwater in the selected area were measured by the AAN Field Kit in the field. About 10% of them were sampled and measured by the AAS in the Jhenaidah laboratory for crosscheck. It was very useful to know the correlation between the results of the field kit and AAS for evaluating the results as well as for checking questionable results by KF.

Figure 3.3.20 shows the comparison of As concentrations measured by the AAN Field Kit and AAS by log-log plot. The results show that the field kit results tend to be relatively lower than AAS for As concentrations below 0.070mg/l by AAS and relatively higher above that value. For example, the samples showing 0.02mg/l by FK range from 0.0029 to 0.035mg/l by AAS. The samples showing 1.0mg/l by FK range from 0.058 to 0.28mg/l by AAS. The match point of [Y = X] and the linear fit line is 0.070mg/l. Therefore, it can be said statistically that the FK results and AAS results show a good agreement near the As concentration of the Standard in Bangladesh for drinking purpose, which is 0.05mg/l.

3.2.6 Quality Control

In order to get accurate data, a quality control program was carried out such as pre-training, chain-of-custody procedures for samples, SOP, QC samples, etc.

1) Quality control for field-testing

In the field, measurement of As by field kit is the most important work in the Screening Survey. Therefore a reproducibility test was done at the site by using blind samples. Surveyors tested the blind samples every morning at the site and reported the answers to the field-testing manager.

Figure 3.2.21 shows the results of reproducibility of As field kit testing. As the figure shows, the As testing by field kit demonstrates acceptable level of precision for field testing.

2) Quality control for laboratory testing

As noted in Chapter 3 of the Supporting Report, various QC programs were carried out as well as other surveys. The results of the QC samples (duplicate samples) are shown in Figure 3.2.22. The figure shows that there is good correlation. Another QC sample group (travel-blank sample) also shows good results, which are all below PQL (0.0005mg/l).

Table 3.2.1 Results of Screening Survey (Ramlhandrapur: No.1 to No.122)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/15	SS-RH-1-01	22 55'35"	89 13'48"	2537122	728693	0.0	130.5	7.04	-117	25.0	89.4	0.40		
2	2002/1/15	SS-RH-1-02	22 55'37"	89 13'45"	2537158	728614	61.0	124.3	7.02	-119	24.1	88.0	0.50		
3	2002/1/15	SS-RH-1-03	22 55'34"	89 13'45"	2537086	728618	54.9								Unused
4	2002/1/15	SS-RH-1-04	22 55'36"	89 13'45"	2537122	728613	67.1								Unused
5	2002/1/15	SS-RH-1-05	22 55'34"	89 13'34"	2537069	728600	67.1	122.2	7.04	-118	25.3	88.2	0.50		
6	2002/1/15	SS-RH-1-06	22 55'37"	89 13'46"	2537166	728645	54.9	125.6	7.15	-108	25.6	97.9	0.40		
7	2002/1/15	SS-RH-1-07	22 55'35"	89 13'35"	2537075	728353	32.0	102.5	7.06	-118	25.8	87.8	0.60		
8	2002/1/15	SS-RH-1-08	22 55'35"	89 13'34"	2537106	728295	32.0	127.5	7.10	-116	24.6	90.7	0.50		
9	2002/1/15	SS-RH-1-09	22 55'37"	89 13'34"	2537148	728295	57.9	190.9	6.81	-105	25.3	101.2	0.30		
10	2002/1/16	SS-RH-1-10	22 55'37"	89 13'32"	2537142	728254	41.8	120.3	6.96	-125	25.3	81.2	0.70	0.32	
11	2002/1/16	SS-RH-1-11	22 55'31"	89 13'40"	2536971	728467	38.1	122.3	6.99	-118	25.7	87.9	0.60		
12	2002/1/15	SS-RH-2-01	22 55'37"	89 13'54"	2537157	728866	44.2	134.3	7.18	-120	25.7	85.9	0.50		
13	2002/1/15	SS-RH-2-02	22 55'35"	89 13'55"	2537122	728889	57.9	132.3	7.24	-128	25.3	78.2	0.50		
14	2002/1/15	SS-RH-2-03	22 55'36"	89 13'55"	2537124	728887	53.3	138.4	7.17	-138	26.0	67.6	0.40		
15	2002/1/15	SS-RH-2-04	22 55'35"	89 13'56"	2537114	728935	53.3	131.1	7.25	-129	26.0	76.6	0.20		
16	2002/1/15	SS-RH-2-05	22 55'36"	89 13'58"	2537149	728973	53.3	124.1	7.24	-121	26.0	84.6	0.50		
17	2002/1/15	SS-RH-2-06	22 55'34"	89 13'55"	2537064	728895	59.4	130.6	7.21	-134	26.1	71.6	0.50		
18	2002/1/15	SS-RH-2-07	22 55'40"	89 13'53"	2537264	728852	53.3	124.5	7.22	-134	25.9	71.7	0.50		
19	2002/1/15	SS-RH-2-08	22 55'41"	89 13'56"	2537290	728914	53.3	128.6	7.19	-129	25.9	76.7	0.60		
20	2002/1/15	SS-RH-2-09	22 55'35"	89 13'51"	2537115	728786	57.9	129.6	7.22	-259	25.6	-53.1	0.60		
21	2002/1/15	SS-RH-2-10	22 55'35"	89 13'52"	2537096	728700	53.3	134.3	7.16	-250	25.2	-43.8	0.30	0.31	
22	2002/1/15	SS-RH-2-11	22 55'34"	89 13'50"	2537086	728752	57.9	125.8	7.21	-244	25.6	-38.1	0.40		
23	2002/2/14	SS-RH-1-12	22 55'36"	89 13'34"	2537114	728301	38.1								Unused
24	2002/1/15	SS-RH-2-12	22 55'33"	89 13'47"	2537054	728676	UK	127.1	7.21	-237	25.2	-30.8	0.50		
25	2002/1/15	SS-RH-3-01	22 55'43"	89 14'00"	2537348	728944	54.9	123.2	7.08	-135	25.6	70.9	0.60		
26	2002/1/15	SS-RH-3-02	22 55'46"	89 14'00"	2537457	729024	UK	131.9	7.02	-128	25.3	78.2	0.80		
27	2002/1/15	SS-RH-3-03	22 55'46"	89 14'02"	2537448	729086	UK								Unused
28	2002/1/15	SS-RH-3-04	22 55'47"	89 14'01"	2537478	729056	53.3	132.6	7.07	-133	26.1	72.6	0.50		
29	2002/1/15	SS-RH-3-05	22 55'53"	89 13'59"	2537672	729011	73.2	175.2	6.98	-132	25.8	73.8	0.60		
30	2002/1/15	SS-RH-3-06	22 55'53"	89 13'59"	2537653	729003	61.0	163.7	7.02	-120	26.2	85.5	0.50		
31	2002/1/15	SS-RH-3-07	22 55'51"	89 13'59"	2537617	728995	48.8	154.6	7.10	-126	26.0	79.6	0.50		
32	2002/1/15	SS-RH-3-08	22 55'51"	89 13'59"	2537599	729006	UK	156.2	7.06	-128	25.9	77.7	0.60		
33	2002/1/15	SS-RH-3-09	22 55'49"	89 13'59"	2537545	729009	UK	119.9	7.00	-136	26.1	69.6	0.70		
34	2002/1/15	SS-RH-3-10	22 55'46"	89 14'07"	2537462	729229	36.6	143.6	7.02	-114	25.6	91.9	0.60	0.33	
35	2002/1/15	SS-RH-03-11	22 55'48"	89 14'09"	2537522	729283	32.0	159.6	7.00	-116	25.6	89.9	0.70		
36	2002/1/15	SS-RH-4-01	22 56'07"	89 14'04"	2538091	729143	97.5	113.3	7.11	-68	25.3	138.2	0.40		
37	2002/1/15	SS-RH-4-02	22 55'58"	89 14'02"	2537811	729101	54.9	186.3	7.04	-45	25.3	161.2	0.60		
38	2002/1/15	SS-RH-4-03	22 55'57"	89 14'03"	2537802	729123	67.1	131.8	7.15	-42	25.5	164.0	0.40		
39	2002/1/15	SS-RH-4-04	22 55'57"	89 14'01"	2537798	729060	73.2	134.5	7.10	-81	26.2	124.5	0.50		
40	2002/1/15	SS-RH-4-05	22 55'57"	89 14'03"	2537798	729103	73.2	130.4	7.15	-25	24.9	181.4	0.70		
41	2002/1/15	SS-RH-4-06	22 55'55"	89 14'01"	2537719	729076	73.2	118.7	7.18	-27	25.9	178.7	0.50		
42	2002/1/15	SS-RH-4-07	22 55'53"	89 14'02"	2537685	729091	73.2	72.0	7.17	-52	25.8	153.8	0.40		
43	2002/1/15	SS-RH-4-08	22 55'53"	89 14'02"	2537668	729091	79.2	69.6	7.13	-83	25.6	122.9	0.60		
44	2002/1/15	SS-RH-4-09	22 55'54"	89 14'01"	2537694	729057	79.2	171.0	7.10	-87	25.4	119.1	0.30		
45	2002/1/15	SS-RH-4-10	22 55'51"	89 14'02"	2537596	729088	64.0	118.2	7.16	-43	25.4	163.1	0.50	0.25	
46	2002/1/15	SS-RH-05-01	22 55'04"	89 14'00"	2538011	729023	48.8	137.9	7.07	-93	25.2	113.2	0.50		
47	2002/1/15	SS-RH-05-02	22 56'07"	89 13'99"	2538025	729001	53.6	126.9	7.18	-76	25.2	130.2	0.40		
48	2002/1/15	SS-RH-05-03	22 56'04"	89 14'00"	2537996	729027	53.6	125.3	7.10	-83	25.0	123.4	0.60		
49	2002/1/15	SS-RH-05-04	22 56'04"	89 13'59"	2538011	729011	UK	127.6	7.16	-74	25.0	132.4	0.30		
50	2002/1/15	SS-RH-05-05	22 56'02"	89 13'59"	2537939	729002	45.7	124.2	7.01	-78	25.0	128.4	0.50		
51	2002/1/15	SS-RH-05-06	22 56'03"	89 13'58"	2537960	728981	50.3	132.6	7.10	-72	25.8	133.8	0.50		
52	2002/1/15	SS-RH-05-07	22 56'01"	89 13'59"	2537937	728991	45.7	127.6	7.16	-65	25.0	141.4	0.50		
53	2002/1/15	SS-RH-05-08	22 56'07"	89 13'59"	2538081	728991	45.7	127.6	7.16	-65	25.0	141.4	0.50	0.27	
54	2002/1/16	SS-RH-05-09	22 56'02"	89 13'58"	2537923	728979	61.0	129.3	7.07	-86	25.3	120.2	0.30		
55	2002/1/16	SS-RH-05-10	22 56'00"	89 13'58"	2537868	728976	UK	132.8	7.18	-156	25.9	49.7	0.60		
56	2002/1/16	SS-RH-05-11	22 56'01"	89 13'56"	2537918	7289 5	61.0	132.7	7.05	-43	24.4	163.8	0.40	0.19	
57	2002/1/16	SS-RH-05-12	22 56'01"	89 13'57"	2537918	728930	57.9	128.8	7.10	-22	25.3	184.2	0.30		
58	2002/1/16	SS-RH-05-13	22 55'58"	89 13'53"	2537917	728840	59.4	76.7	7.06	-62	25.9	143.7	0.40		
59	2002/1/16	SS-RH-05-14	22 55'56"	89 13'52"	2537764	728813	51.8	154.6	7.13	-115	25.9	90.7	0.30		

Table 3.2.1 Results of Screening Survey (Ramlhandrapur: No.1 to No.122)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
60	2002/1/16	SS-RH-05-15	22 55'59"	89 13'59"	2537836	728992	56.4	135.8	7.22	-132	25.6	73.9	0.30		
61	2002/1/16	SS-RH-05-16	22 55'58"	89 13'59"	2537814	728992	49.7	136.6	7.12	-86	25.6	119.9	0.50		
62	2002/1/16	SS-RH-05-17	22 56'09"	89 13'53"	2538146	728819	48.8	50.2	7.12	-120	25.9	85.7	0.20		
63	2002/1/16	SS-RH-05-18	22 56'09"	89 13'52"	2538152	728789	67.1	105.2	7.14	-55	25.4	151.1	0.50		
64	2002/1/16	SS-RH-05-19	22 56'10"	89 13'52"	2538147	728833	54.9	108.7	7.13	-64	25.1	142.3	0.60	0.26	
65	2002/1/16	SS-RH-05-20	22 56'10"	89 13'53"	2538200	728835	42.7	117.0	7.10	-22	24.9	184.4	0.30		
66	2002/1/16	SS-RH-05-21	22 56'08"	89 13'51"	2538109	728765	47.2	116.5	7.16	-68	25.0	138.4	0.50		
67	2002/1/16	SS-RH-05-22	22 56'56"	89 13'58"	2537744	728985	103.6	109.0	7.06	-122	25.8	83.8	0.70		
68	2002/1/16	SS-RH-05-23	22 55'55"	89 13'58"	2537739	728969	64.0	85.1	7.09	-125	25.9	80.7	0.60		
69	2002/1/16	SS-RH-05-24	22 55'56"	89 13'59"	2537759	729012	51.8	127.9	7.20	-125	25.3	81.2	0.70		
70	2002/1/17	SS-RH-05-25	22 56'04"	89 13'47"	2538000	728660	61.0	124.4	7.07	-24	24.5	182.7	0.50		
71	2002/1/17	SS-RH-05-26	22 56'04"	89 13'48"	2537996	728687	UK	113.6	7.12	-77	24.3	129.9	0.40		
72	2002/1/17	SS-RH-05-27	22 56'04"	89 13'46"	2538005	728613	57.9	118.0	7.04	-38	24.6	168.7	0.50		
73	2002/1/17	SS-RH-05-28	22 56'05"	89 13'47"	2538035	728643	61.0	104.5	7.10	-77	24.4	129.8	0.60		
74	2002/1/17	SS-RH-05-29	22 56'05"	89 13'45"	2538020	728604	61.0	114.6	7.13	-58	24.1	149.0	0.30	0.23	
75	2002/1/17	SS-RH-05-30	22 56'04"	89 13'45"	2537993	728604	35.1	142.4	6.95	-55	24.5	151.7	0.30		
76	2002/1/17	SS-RH-05-31	22 56'04"	89 13'43"	2538008	728550	51.8	149.1	6.89	-32	24.9	174.4	0.20		
77	2002/1/17	SS-RH-05-32	22 56'06"	89 13'44"	2538065	728561	82.3	106.4	7.12	-88	25.4	118.1	0.60		
78	2002/1/17	SS-RH-05-33	22 56'01"	89 13'44"	2537930	728577	36.6	141.7	7.04	-32	25.3	174.2	0.60		
79	2002/1/17	SS-RH-05-34	22 56'02"	89 13'44"	2537944	728558	31.7	137.9	6.96	-35	24.8	171.5	0.30	0.12	
80	2002/1/17	SS-RH-05-35	22 55'58"	89 13'51"	2537811	728781	42.7	74.7	6.93	-31	25.9	174.7	0.30		
81	2002/1/17	SS-RH-05-36	22 55'59"	89 13'51"	2537851	728777	51.8								Unused
82	2002/1/17	SS-RH-05-37	22 55'58"	89 13'50"	2537841	728752	42.7	148.0	7.07	-32	25.4	174.1	0.50		
83	2002/1/17	SS-RH-05-38	22 55'58"	89 13'50"	2537827	728754	42.7	147.2	7.08	-51	24.8	155.5	0.60		
84	2002/1/17	SS-RH-05-39	22 56'00"	89 13'44"	2537876	728568	54.9	105.3	7.10	-80	25.5	126.0	0.60	0.27	
85	2002/1/17	SS-RH-05-40	22 56'00"	89 13'44"	2537887	728554	38.1								Unused
86	2002/1/17	SS-RH-05-41	22 56'02"	89 13'43"	2537918	728536	36.6								Unused
87	2002/1/17	SS-RH-05-42	22 56'02"	89 13'41"	2537919	728480	54.9	121.8	6.97	-30	25.4	176.1	0.50		
88	2002/1/17	SS-RH-05-43	22 55'54"	89 13'41"	2537699	728499	59.4	114.1	7.07	-20	24.8	186.5	0.60		
89	2002/1/17	SS-RH-05-44	22 55'55"	89 13'40"	2537712	728446	47.2	118.7	7.09	-88	24.4	118.8	0.40		
90	2002/1/17	SS-RH-05-45	22 56'06"	89 13'37"	2538064	728379	51.8	114.7	7.10	-49	24.3	157.9	0.90		
91	2002/1/17	SS-RH-05-46	22 56'07"	89 13'37"	2538088	728369	47.2	101.3	7.16	-60	24.1	147.0	0.20		
92	2002/1/17	SS-RH-05-47	22 56'06"	89 13'36"	2538126	728331	42.7	100.8	7.14	-32	24.6	174.7	0.30		
93	2002/1/18	SS-RH-05-48	22 56'09"	89 13'38"	2538137	728393	42.7	112.0	7.13	-66	23.7	141.3	0.30		
94	2002/1/18	SS-RH-05-49	22 56'04"	89 13'30"	2537991	728410	42.7	137.3	7.02	-23	24.9	183.4	0.30	0.20	
95	2002/1/18	SS-RH-05-50	22 56'05"	89 13'37"	2538014	728379	48.8								Unused
96	2002/1/18	SS-RH-05-51	22 56'03"	89 13'38"	2537957	728401	33.5	115.2	7.05	-32	25.1	174.3	0.40		
97	2002/1/18	SS-RH-05-52	22 56'03"	89 13'39"	2537948	728429	54.9								Unused
98	2002/1/18	SS-RH-05-53	22 56'00"	89 13'37"	2537873	728370	56.4	105.3	7.11	-41	25.4	165.1	0.80		
99	2002/1/18	SS-RH-05-54	22 55'59"	89 13'36"	2537873	728368	51.8	105.3	7.07	-64	24.8	142.5	0.30		
100	2002/1/18	SS-RH-05-55	22 56'00"	89 13'39"	2537852	728425	51.8	113.9	7.05	-36	25.3	170.2	0.40		
101	2002/1/18	SS-RH-05-56	22 55'59"	89 13'38"	2537839	728407	38.1	96.9	7.13	-62	25.1	144.3	0.50		
102	2002/1/18	SS-RH-05-57	22 55'59"	89 13'38"	2537829	728414	38.1	106.7	7.18	-56	24.5	150.7	0.40		
103	2002/1/18	SS-RH-05-58	22 55'58"	89 13'39"	2537809	728429	33.5	117.9	7.11	-37	25.1	169.3	0.60		
104	2002/1/18	SS-RH-05-59	22 55'57"	89 13'38"	2537779	728416	47.2	117.9	7.21	-44	24.9	162.4	0.60	0.25	
105	2002/1/18	SS-RH-05-60	22 55'51"	89 13'39"	2537604	728425	47.2	113.3	7.09	-53	25.4	153.1	0.30		
106	2002/1/18	SS-RH-05-61	22 55'57"	89 13'38"	2537581	728398	54.9	46.0	7.07	-106	25.0	100.4	0.60		
107	2002/1/18	SS-RH-05-62	22 55'50"	89 13'38"	2537554	728396	UK	117.0	7.07	-117	24.8	89.5	0.50		
108	2002/1/18	SS-RH-05-63	22 55'48"	89 13'36"	2537491	728337	48.8	120.1	7.04	-37	25.0	169.4	0.40		
109	2002/1/18	SS-RH-05-64	22 55'48"	89 13'35"	2537515	728327	57.9	44.6	7.12	-113	25.0	93.4	0.50		
110	2002/1/18	SS-RH-05-65	22 55'48"	89 13'37"	2537491	728373	42.7	116.8	7.05	-68	24.9	138.4	0.60		
111	2002/1/18	SS-RH-05-66	22 55'46"	89 13'37"	2537445	728381	51.8	50.6	7.01	-80	25.1	126.3	0.40		
112	2002/1/18	SS-RH-05-67	22 55'46"	89 13'38"	2537442	728398	51.8	48.8	7.04	-23	25.4	183.1	0.50		
113	2002/1/17	SS-RH-05-68	22 55'45"	89 13'37"	2537396	728402	67.1	115.4	7.11	-116	25.3	90.2	0.60		
114	2002/1/17	SS-RH-05-69	22 55'48"	89 13'39"	2537494	728438	68.6	111.0	7.11	-38	24.0	169.1	0.30	0.31	
115	2002/1/17	SS-RH-05-70	22 55'47"	89 13'39"	2537467	728438	51.8	113.9	7.13	-87	24.7	119.6	0.50	0.27	
116	2002/1/17	SS-RH-05-71	22 56'02"	89 13'51"	2537935	728777	61.0	131.9	7.35	-106	23.5	101.4	0.40		
117	2002/1/20	SS-RH-05-72	22 56'03"	89 13'51"	2537957	728768	UK	126.7	7.36	-107	24.2	99.9	0.50		
118	2002/1/20	SS-RH-05-73	22 56'03"	89 13'51"	2537960	728783	42.7	138.7	7.36	-102	24.2	104.9	0.30		
119	2002/1/20	SS-RH-05-74	22 55'50"	89 13'44"	2537576	728581	42.7	111.6	7.34	-105	24.6	101.7	0.50		
120	2002/1/20	SS-RH-05-75	22 55'53"	89 13'43"	2537665	728558	52.4	116.7	7.35	-105	24.5	101.7	0.50		
121	2002/1/20	SS-RH-05-76	22 55'54"	89 13'41"	2537696	728474	54.9	109.5	7.54	-70	24.3	136.9	0.50		
122	2002/2/14	SS-RH-05-77	22 56'07"	89 13'50"	2538091	728731	44.2								Unused

Table 3.2.2 Results of Screening Survey (Byasdanga: No.1 to No.47)

No.	Date	Well No.	Coodinates 1				Depth (ft)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/17	SS -BY -2 -01	22 55'28"	89 14'26"	2536989	729782	51.8	146.9	7.24	-239	25.4	-32.9	0.60		
2	2002/1/17	SS -BY -2 -02	22 55'26"	89 14'26"	2536833	729784	51.8	149.8	7.29	-228	25.8	-22.2	0.70		
3	2002/1/17	SS -BY -2 -03	22 55'26"	89 14'28"	2536836	729837	51.8	149.7	7.25	-242	25.5	-36.0	0.20		
4	2002/1/17	SS -BY -2 -04	22 55'27"	89 14'29"	2536866	729865	UK	155.5	7.28	-219	24.9	-12.6	0.50		
5	2002/1/17	SS -BY -2 -05	22 55'28"	89 14'30"	2536866	729886	47.2	152.5	7.27	-235	25.5	-29.0	0.60		
6	2002/1/17	SS -BY -2 -06	22 55'28"	89 14'31"	2536911	729922	47.2	161.7	7.21	-244	25.7	-38.1	0.50		
7	2002/1/17	SS -BY -2 -07	22 55'29"	89 14'30"	2536944	729888	51.8	153.4	7.25	-233	25.3	-26.8	0.60		
8	2002/1/17	SS -BY -2 -08	22 55'30"	89 14'31"	2536968	729924	59.4	165.5	7.22	-235	25.6	-29.1	0.50		
9	2002/1/17	SS -BY -2 -09	22 55'25"	89 14'32"	2536811	729944	56.4	143.5	7.35	-228	25.7	-22.1	0.60		
10	2002/1/17	SS -BY -2 -10	22 55'27"	89 14'35"	2536883	730044	51.8	177.4	7.15	-237	25.5	-31.0	0.40	0.35	
11	2002/1/17	SS -BY -2 -11	22 55'25"	89 14'36"	2536834	730078	42.7	153.0	7.27	-230	26.3	-24.6	1.00		
12	2002/1/17	SS -BY -2 -12	22 55'26"	89 14'36"	2536851	730084	44.2								Unused
13	2002/1/17	SS -BY -2 -13	22 55'26"	89 14'39"	2536848	730160	UK	166.7	7.27	-213	25.3	-6.8	0.50		
14	2002/1/18	SS -BY -2 -14	22 55'25"	89 14'40"	2536816	730192	51.8	173.1	7.28	-120	24.2	86.9	1.00		
15	2002/1/18	SS -BY -2 -15	22 55'25"	89 14'40"	2536833	730175	53.3	158.1	7.26	-185	25.1	21.3	0.30		
16	2002/1/18	SS -BY -2 -16	22 55'30"	89 14'39"	2536966	730158	47.2	184.2	7.19	-229	25.3	-22.8	0.30		
17	2002/1/18	SS -BY -2 -17	22 55'28"	89 14'37"	2536920	730091	48.8	181.2	7.18	-211	25.4	-4.9	0.50		
18	2002/1/18	SS -BY -2 -18	22 55'27"	89 14'36"	2536892	730081	45.7	183.5	7.19	-219	25.6	-13.1	0.40		
19	2002/1/18	SS -BY -2 -19	22 55'32"	89 14'35"	2537023	730024	57.9	172.5	7.35	-203	25.4	3.1	0.40		
20	2002/2/14	SS -BY -2 -20	22 55'25"	89 14'40"	2536825	730189	UK								Unused
21	2002/1/17	SS -BY -3 -01	22 55'30"	89 14'21"	2536946	729648	UK	136.6	7.07	-132	25.2	74.2	0.60		
22	2002/1/17	SS -BY -3 -02	22 55'28"	89 14'22"	2536915	729661	UK	138.8	7.12	-142	25.1	64.3	0.50		
23	2002/1/17	SS -BY -3 -03	22 55'30"	89 14'29"	2536952	729778	61.0	144.9	7.15	-126	25.3	80.2	0.60		
24	2002/1/17	SS -BY -3 -04	22 55'30"	89 14'27"	2536972	729797	51.8	153.2	7.21	-135	25.3	71.2	0.60		
25	2002/1/17	SS -BY -3 -05	22 55'30"	89 14'28"	2536980	729852	52.4	151.9	7.21	-133	25.2	73.2	0.60		
26	2002/1/17	SS -BY -3 -06	22 55'33"	89 14'26"	2537046	729786	UK	160.0	7.17	-130	25.9	75.7	0.50		
27	2002/1/17	SS -BY -3 -07	22 55'34"	89 14'27"	2537099	729921	64.0	147.5	7.23	-126	25.5	80.0	0.60		
28	2002/1/17	SS -BY -3 -08	22 55'40"	89 14'30"	2537258	729886	UK	158.3	7.15	-119	26.1	86.6	0.60		
29	2002/1/17	SS -BY -3 -09	22 55'42"	89 14'31"	2537326	729912	61.0	234.0	6.98	-123	25.8	82.8	0.70		
30	2002/1/17	SS -BY -3 -10	22 55'71"	89 14'51"	2537361	729917	61.0								Unused
31	2002/1/17	SS -BY -3 -11	22 55'71"	89 14'53"	2537368	729948	48.2	184.5	7.22	-121	25.1	85.3	0.70	0.45	
32	2002/1/17	SS -BY -3 -12	22 55'73"	89 14'59"	2537398	730048	64.0	136.3	7.24	-126	25.8	79.8	0.70		
33	2002/1/17	SS -BY -3 -13	22 55'73"	89 14'55"	2537387	730147	61.0	144.5	7.23	-131	25.8	74.8	0.60		
34	2002/1/17	SS -BY -3 -14	22 55'72"	89 14'67"	2537379	730184	54.9	169.3	7.19	-125	25.6	80.9	0.60		
35	2002/1/17	SS -BY -3 -15	22 55'78"	89 14'68"	2537498	730191	59.4	158.7	7.18	-120	25.4	86.1	0.60		
36	2002/1/17	SS -BY -3 -16	22 55'80"	89 14'67"	2537531	730188	48.8	159.8	7.24	-125	25.6	80.9	0.70		
37	2002/1/17	SS -BY -3 -17	22 55'81"	89 14'59"	2537537	730215	50.3	178.0	7.20	-120	25.6	85.9	0.60		
38	2002/1/17	SS -BY -3 -18	22 55'82"	89 14'71"	2537566	730255	54.9	166.3	7.19	-122	25.5	84.0	0.70		
39	2002/1/17	SS -BY -3 -19	22 55'87"	89 14'73"	2537663	730277	UK	154.9	7.20	-120	25.6	85.9	0.60		
40	2002/1/18	SS -BY -3 -20	22 55'88"	89 14'75"	2537675	730311	54.9	157.6	7.23	-115	25.6	90.9	0.60	0.34	
41	2002/1/18	SS -BY -3 -21	22 55'88"	89 14'77"	2537681	730345	54.9	162.6	7.21	-125	25.7	80.9	0.50		
42	2002/1/18	SS -BY -3 -22	22 55'72"	89 14'72"	2537381	730268	56.4								Unused
43	2002/1/18	SS -BY -3 -23	22 55'71"	89 14'73"	2537371	730278	61.0	182.8	7.22	-128	25.2	78.2	0.60		
44	2002/1/18	SS -BY -3 -24	22 55'68"	89 14'71"	2537296	730254	56.4	198.4	7.15	-131	25.5	75.0	0.70		
45	2002/1/18	SS -BY -3 -25	22 55'68"	89 14'72"	2537309	730273	UK	196.6	7.12	-133	25.7	72.9	0.60		
46	2002/1/18	SS -BY -3 -26	22 55'72"	89 14'76"	2537396	730327	UK	166.5	7.24	-119	25.7	86.9	0.70		
47	2002/1/18	SS -BY -3 -27	22 55'63"	89 14'71"	2537213	730255	54.9	207.0	7.10	-118	25.6	87.9	0.80		

Table 3.2.3 Results of Screening Survey (Brahmakati: No.1 to No.109)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/17	SS-BM-1-01	22 54'53"	89 13'30"	2535797	728210	53.3	128.1	6.94	-114	25.4	92.1	0.50		
2	2002/1/17	SS-BM-1-02	22 54'53"	89 13'28"	2535793	728140	53.3	122.1	6.90	-117	25.2	89.2	0.50		
3	2002/1/17	SS-BM-1-03	22 54'55"	89 13'25"	2535877	728057	57.9	122.8	6.90	-93	23.5	114.4	0.60		
4	2002/1/17	SS-BM-1-04	22 54'55"	89 13'24"	2535857	728036	UK	126.5	6.90	-100	23.9	107.2	0.40		
5	2002/1/17	SS-BM-1-05	22 54'57"	89 13'24"	2535933	728035	45.7	138.5	7.10	-99	23.4	108.5	0.50		
6	2002/1/17	SS-BM-1-06	22 54'58"	89 13'27"	2535947	728131	57.9	120.4	7.40	-105	23.6	102.4	0.50		
7	2002/1/17	SS-BM-1-07	22 55'00"	89 13'23"	2536030	727990	42.7	121.9	7.12	-109	24.2	97.9	0.40		
8	2002/1/17	SS-BM-1-08	22 55'01"	89 13'23"	2536054	728000	47.2	112.9	7.22	-118	23.9	89.2	0.60		
9	2002/1/17	SS-BM-1-09	22 55'01"	89 13'23"	2536054	728016	53.3	108.5	7.21	-114	24.2	92.9	0.50		
10	2002/1/17	SS-BM-1-10	22 55'02"	89 13'23"	2536074	728010	51.8	111.2	7.25	-125	24.2	81.9	0.50	0.43	
11	2002/1/18	SS-BM-1-11	22 54'57"	89 13'31"	2535913	728234	61.0								Unused
12	2002/1/18	SS-BM-1-12	22 54'57"	89 13'31"	2535929	728219	56.4	128.0	7.12	-101	23.4	106.5	0.40		
13	2002/1/18	SS-BM-1-13	22 54'57"	89 13'32"	2535940	728250	48.8	125.0	7.14	-104	23.3	103.6	0.40		
14	2002/1/18	SS-BM-1-14	22 54'55"	89 13'33"	2535880	728284	77.7	115.7	7.15	-114	22.6	94.1	0.30		
15	2002/1/18	SS-BM-1-15	22 54'56"	89 13'31"	2535889	728244	65.5	131.2	7.02	-109	22.4	99.2	0.50		
16	2002/1/18	SS-BM-1-16	22 54'58"	89 13'32"	2535963	728268	47.2	128.0	7.16	-100	23.3	107.6	0.50		
17	2002/1/18	SS-BM-1-17	22 55'00"	89 13'33"	2536012	728300	57.9	122.4	7.14	-118	23.6	89.4	0.40		
18	2002/1/18	SS-BM-1-18	22 55'00"	89 13'34"	2536015	728320	61.0	120.9	7.13	-120	23.7	87.3	0.60		
19	2002/1/18	SS-BM-1-19	22 55'01"	89 13'34"	2536065	728327	47.2	123.5	7.17	-113	23.2	94.7	0.60		
20	2002/1/18	SS-BM-1-20	22 55'02"	89 13'33"	2536099	728377	51.8	121.8	7.17	-115	23.4	92.5	0.50	0.38	
21	2002/1/18	SS-BM-1-21	22 55'03"	89 13'31"	2536106	728318	UK	123.6	7.14	-116	23.6	91.4	0.60		
22	2002/1/18	SS-BM-1-22	22 55'03"	89 13'28"	2536113	728157	50.3	120.0	7.11	-116	23.6	91.4	0.50		
23	2002/1/19	SS-BM-1-23	22 55'03"	89 13'27"	2536113	728130	50.3	122.0	7.20	-115	23.6	92.4	0.50		
24	2002/1/19	SS-BM-1-24	22 55'04"	89 13'26"	2536127	728099	55.5	115.2	7.11	-112	23.6	95.4	0.40		
25	2002/1/19	SS-BM-1-25	22 55'03"	89 13'26"	2536111	728076	50.6	118.9	7.03	-114	23.4	93.5	0.50		
26	2002/1/19	SS-BM-1-26	22 55'00"	89 13'29"	2536016	728166	70.1	124.2	6.95	-103	23.6	104.4	0.50		
27	2002/1/19	SS-BM-1-27	22 55'00"	89 13'29"	2536004	728181	51.8	119.4	7.29	-107	23.2	100.7	0.40		
28	2002/1/19	SS-BM-1-28	22 55'03"	89 13'34"	2536031	728316	59.4	126.2	7.32	-105	24.3	101.9	0.50		
29	2002/1/19	SS-BM-1-29	22 55'05"	89 13'33"	2536167	728383	53.3	126.0	7.23	-111	23.4	96.5	0.40		
30	2002/1/19	SS-BM-1-30	22 55'04"	89 13'35"	2536147	728339	56.4	123.1	7.21	-112	23.6	95.4	0.40	0.35	
31	2002/1/19	SS-BM-1-31	22 55'04"	89 13'35"	2536160	728350	51.8	123.8	7.22	-120	23.4	87.5	0.60		
32	2002/1/19	SS-BM-1-32	22 55'03"	89 13'36"	2536121	728369	54.9	123.8	7.19	-119	23.4	88.5	0.50		
33	2002/1/20	SS-BM-1-33	22 55'05"	89 13'31"	2536180	728228	51.8	124.0	7.22	-115	23.2	92.7	0.60		
34	2002/1/19	SS-BM-1-34	22 55'07"	89 13'38"	2536233	728437	53.3	126.6	7.36	-115	23.4	92.5	0.60		
35	2002/1/19	SS-BM-1-35	22 55'08"	89 13'37"	2536280	728408	61.0	127.2	7.35	-116	24.2	90.9	0.60		
36	2002/1/19	SS-BM-1-36	22 55'08"	89 13'38"	2536261	728413	51.8	128.9	7.40	-120	23.6	87.4	0.50		
37	2002/1/20	SS-BM-1-37	22 55'08"	89 13'38"	2536265	728436	51.8	127.5	7.42	-115	23.4	92.5	0.40		
38	2002/1/20	SS-BM-1-38	22 55'08"	89 13'39"	2536272	728468	51.8	128.9	7.17	-100	23.2	107.7	0.50		
39	2002/1/19	SS-BM-1-39	22 55'07"	89 13'40"	2536225	728485	UK	133.0	7.37	-117	23.1	90.7	0.40		
40	2002/1/20	SS-BM-1-40	22 55'12"	89 13'41"	2536414	728484	UK								Unused
41	2002/1/20	SS-BM-1-41	22 55'13"	89 13'40"	2536426	728470	64.6	126.8	7.21	-106	23.2	101.7	0.40		
42	2002/1/20	SS-BM-1-42	22 55'14"	89 13'39"	2536441	728442	49.4	124.3	7.14	-123	22.5	85.2	0.60	0.33	
43	2002/1/20	SS-BM-1-43	22 55'13"	89 13'39"	2536416	728442	UK	125.2	7.18	-110	22.8	98.0	0.40		
44	2002/1/20	SS-BM-1-44	22 55'13"	89 13'39"	2536430	728442	51.8	126.2	7.19	-107	22.5	101.2	0.60		
45	2002/1/20	SS-BM-1-45	22 55'15"	89 13'39"	2536490	728453	51.8	123.2	7.23	-107	22.3	101.3	0.50		
46	2002/1/20	SS-BM-1-46	22 55'15"	89 13'40"	2536500	728476	70.1	128.7	7.22	-111	23.2	96.7	0.50		
47	2002/1/20	SS-BM-1-47	22 55'16"	89 13'41"	2536515	728505	56.4	118.0	7.33	-110	24.2	96.9	0.50		
48	2002/1/20	SS-BM-1-48	22 55'21"	89 13'42"	2536673	728529	UK								Unused
49	2002/1/20	SS-BM-1-49	22 55'22"	89 13'41"	2536714	728593	44.2	140.7	7.23	-101	24.4	105.4	0.50	0.29	
50	2002/1/17	SS-BM-5-1	22 54'54"	89 13'35"	2535842	728347	50.3	129.8	7.01	-77	24.9	129.4	0.30		
51	2002/1/17	SS-BM-5-2	22 54'54"	89 13'35"	2535826	728340	UK	134.9	6.98	-80	24.9	126.4	0.50		
52	2002/1/17	SS-BM-5-3	22 54'53"	89 13'35"	2535800	728352	54.9	131.8	6.94	-79	25.0	127.4	0.50		
53	2002/1/17	SS-BM-5-4	22 54'52"	89 13'35"	2535766	728350	54.9	132.9	7.05	-80	25.2	126.2	0.60		
54	2002/1/17	SS-BM-5-5	22 54'53"	89 13'36"	2535814	728366	UK								Unused
55	2002/1/17	SS-BM-5-6	22 54'54"	89 13'35"	2535854	728360	73.2	124.7	6.84	-78	24.9	128.4	0.50		
56	2002/1/17	SS-BM-5-7	22 54'52"	89 13'38"	2535793	728442	UK	129.1	6.90	-78	25.6	127.9	0.50		
57	2002/1/17	SS-BM-5-8	22 54'48"	89 13'48"	2535661	728724	48.8	138.5	7.10	-120	23.7	87.3	0.70		
58	2002/1/17	SS-BM-5-9	22 55'00"	89 13'38"	2536016	728421	54.9	126.8	7.14	-137	25.7	68.9	0.50		

Table 3.2.3 Results of Screening Survey (Brahmakati: No.1 to No.109)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
59	2002/1/17	SS-BM-5-10	22 54'00"	89 13'39"	2536014	728446	54.9	126.8	7.13	-134	25.1	72.3	0.60	0.41	
60	2002/1/17	SS-BM-5-11	22 55'00"	89 13'38"	2536016	728439	57.9	127.8	7.15	-140	25.8	65.8	0.60		
61	2002/1/17	SS-BM-5-12	22 54'59"	89 13'38"	2535991	728429	UK	123.9	7.13	-137	25.5	69.0	0.50		
62	2002/1/17	SS-BM-5-13	22 55'02"	89 13'39"	2536088	728444	45.7	130.3	6.93	-138	25.6	67.9	0.60		
63	2002/1/17	SS-BM-5-14	22 55'02"	89 13'40"	2536085	728488	45.7	130.7	7.13	-135	25.5	71.0	0.50		
64	2002/1/17	SS-BM-5-15	22 55'03"	89 13'40"	2536104	728486	50.3	125.5	7.15	-148	25.6	57.9	0.60		
65	2002/1/18	SS-BM-5-16	22 55'06"	89 13'43"	2536198	728569	54.9	134.4	7.40	-132	25.2	74.2	0.50		
66	2002/1/18	SS-BM-5-17	22 55'04"	89 13'43"	2536162	728579	UK	130.1	7.21	-137	25.4	69.1	0.60		
67	2002/1/18	SS-BM-5-18	22 55'05"	89 13'44"	2536169	728594	UK								Unused
68	2002/1/18	SS-BM-5-19	22 55'05"	89 13'45"	2536270	728638	42.7	134.5	6.96	-121	25.2	85.2	0.50		
69	2002/1/18	SS-BM-5-20	22 55'05"	89 13'45"	2536205	728647	50.3	128.9	7.23	-142	25.3	64.2	0.60	0.41	
70	2002/1/18	SS-BM-5-21	22 55'06"	89 13'44"	2536208	728601	UK	133.2	7.14	-134	25.6	71.9	0.60		
71	2002/1/18	SS-BM-5-22	22 55'07"	89 13'44"	2536255	728608	50.3	124.9	7.14	-132	25.8	73.8	0.70		
72	2002/1/18	SS-BM-5-23	22 55'08"	89 13'43"	2536274	728578	51.8	125.9	7.25	-140	25.8	65.8	0.50		
73	2002/1/18	SS-BM-5-24	22 55'10"	89 13'50"	2536336	728761	45.7	130.9	7.15	-127	25.9	78.7	0.70		
74	2002/1/18	SS-BM-5-25	22 55'12"	89 13'50"	2536381	728767	45.7	130.2	7.17	-158	25.8	47.8	0.60		
75	2002/1/18	SS-BM-5-26	22 55'11"	89 13'48"	2536376	728711	45.7	129.0	7.15	-130	25.7	75.9	0.60		
76	2002/1/18	SS-BM-5-27	22 55'11"	89 13'46"	2536374	728639	45.7	124.4	7.11	-145	25.4	61.1	0.50		
77	2002/1/18	SS-BM-5-28	22 55'11"	89 13'45"	2536351	728625	53.3	125.6	7.21	-128	25.8	77.8	0.60		
78	2002/1/18	SS-BM-5-29	22 55'12"	89 13'47"	2536397	728670	50.3	130.5	7.10	-143	25.4	63.1	0.60		
79	2002/1/18	SS-BM-5-30	22 55'12"	89 13'44"	2536386	728603	50.3	121.1	7.26	-139	25.2	67.2	0.60	0.33	
80	2002/1/18	SS-BM-5-31	22 55'13"	89 13'36"	2536426	728638	45.7	133.3	7.18	-142	25.6	63.9	0.50		
81	2002/1/18	SS-BM-5-32	22 55'13"	89 13'44"	2536434	728601	UK	134.0	7.18	-133	25.1	73.3	0.60		
82	2002/1/19	SS-BM-5-33	22 55'12"	89 13'43"	2536408	728559	51.8	122.0	7.20	-117	25.9	88.7	0.50		
83	2002/1/19	SS-BM-5-34	22 55'18"	89 13'43"	2536594	728572	0.0	123.7	7.18	-121	25.7	84.9	0.60		
84	2002/1/19	SS-BM-5-35	22 55'18"	89 13'46"	2536573	728662	45.7	131.6	7.22	-142	25.6	63.9	0.60		
85	2002/1/19	SS-BM-5-36	22 55'19"	89 13'48"	2536615	728696	45.7	125.1	7.14	-141	25.4	65.1	0.60		
86	2002/1/19	SS-BM-5-37	22 55'23"	89 13'43"	2536745	728553	UK	131.3	7.22	-136	24.9	70.4	0.60		
87	2002/1/19	SS-BM-5-38	22 55'24"	89 13'43"	2536769	728543	45.7	125.2	7.25	-145	25.3	61.2	0.90		
88	2002/1/19	SS-BM-5-39	22 55'25"	89 13'43"	2536790	728571	42.7	112.4	7.27	-150	25.8	55.8	0.60		
89	2002/1/19	SS-BM-5-40	22 55'20"	89 13'52"	2536790	728840	UK	128.0	7.37	-142	25.2	64.2	0.50	0.27	
90	2002/1/19	SS-BM-5-41	22 55'23"	89 13'53"	2536698	728850	45.7	131.3	7.34	-140	25.4	66.1	0.20		
91	2002/1/19	SS-BM-5-42	22 55'22"	89 13'53"	2536690	728845	48.8	129.5	7.21	-140	25.8	65.8	0.40		
92	2002/1/19	SS-BM-5-43	22 55'22"	89 13'43"	2536827	728864	45.7	125.2	7.40	-145	25.1	61.3	0.60		
93	2002/1/19	SS-BM-5-44	22 55'27"	89 13'45"	2536857	728607	45.7	127.8	7.40	-121	25.4	85.1	0.60		
94	2002/1/20	SS-BM-5-45	22 55'27"	89 13'42"	2536871	728532	54.9	133.2	7.20	-105	24.9	101.4	0.60		
95	2002/1/20	SS-BM-5-46	22 55'27"	89 13'42"	2536852	728531	56.4	121.1	7.30	-106	24.8	100.5	0.60		
96	2002/1/20	SS-BM-5-47	22 55'26"	89 13'41"	2536829	728492	56.4	115.5	7.23	-113	26.1	92.6	0.50		
97	2002/1/20	SS-BM-5-48	22 55'26"	89 13'40"	2536818	728468	50.3	113.8	7.30	-109	25.1	97.3	0.50		
98	2002/1/20	SS-BM-5-49	22 55'27"	89 13'40"	2536849	728476	54.9	128.6	7.17	-116	25.5	90.0	0.60		
99	2002/1/20	SS-BM-5-50	22 55'26"	89 13'39"	2536836	728449	54.9	115.8	7.22	-119	25.1	87.3	0.60	0.32	
100	2002/1/20	SS-BM-5-51	22 55'27"	89 13'39"	2536837	728448	50.3	135.0	7.24	-115	25.0	91.4	0.50		
101	2002/1/20	SS-BM-5-52	22 55'29"	89 13'40"	2536910	728460	53.3	119.6	7.21	-130	24.7	76.6	0.40		
102	2002/1/20	SS-BM-5-53	22 55'28"	89 13'41"	2536876	728501	53.3	139.5	7.14	-124	25.5	82.0	0.60		
103	2002/1/20	SS-BM-5-54	22 55'29"	89 13'42"	2536900	728526	48.8								Unused
104	2002/1/20	SS-BM-5-55	22 55'25"	89 13'41"	2536791	728504	UK	111.1	7.34	-126	25.3	80.2	0.40		
105	2002/1/20	SS-BM-5-56	22 55'25"	89 13'40"	2536805	728478	51.8	115.1	7.31	-126	25.1	80.3	0.50		
106	2002/1/20	SS-BM-5-57	22 55'24"	89 13'40"	2536773	728474	54.9	129.5	7.19	-121	25.3	85.2	0.50		
107	2002/1/20	SS-BM-5-58	22 55'24"	89 13'39"	2536770	728454	51.8	124.5	7.17	-113	25.3	93.2	0.60		
108	2002/1/20	SS-BM-5-59	22 55'24"	89 13'39"	2536872	728445	54.9	124.8	7.24	-114	25.6	91.9	0.60		
109	2002/2/14	SS-BM-5-60	22 55'27"	89 13'44"	2536856	728598	54.9	129.4	6.96	-84	24.8	122.5	0.20	0.39	

Table 3.2.4 Results of Screening Survey (Khatiakhali: No.1 to No.66)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/19	SS-KK-03-01	22 55'68"	89 13'83"	2535435	728779	83.8	109.4	7.00	-116	25.8	89.8	0.40		
2	2002/1/19	SS-KK-03-02	22 55'68"	89 13'84"	2535441	728793	UK	121.2	7.07	-129	25.9	76.7	0.60		
3	2002/1/19	SS-KK-03-03	22 54'70"	89 13'24"	2535489	728796	78.0	127.4	7.09	-137	25.2	69.2	0.50		
4	2002/1/19	SS-KK-03-04	22 54'71"	89 13'84"	2535489	728787	120.4	126.3	7.17	-140	25.2	66.2	0.50		
5	2002/1/19	SS-KK-03-05	22 54'71"	89 13'84"	2535498	728801	UK	123.6	7.03	-124	24.8	82.5	0.60		
6	2002/1/19	SS-KK-03-06	22 54'72"	89 13'84"	2535507	728784	UK	127.8	7.05	-129	25.3	77.2	0.60		
7	2002/1/19	SS-KK-03-07	22 54'67"	89 13'86"	2535422	728827	56.4	128.6	7.02	-120	25.6	85.9	0.40		
8	2002/1/19	SS-KK-03-08	22 54'68"	89 13'87"	2535430	728844	56.4	127.0	7.05	-118	25.8	87.8	0.50		
9	2002/1/19	SS-KK-03-09	22 54'69"	89 13'88"	2535451	728859	UK	126.7	7.04	-123	25.7	82.9	0.60		
10	2002/1/19	SS-KK-03-10	22 54'69"	89 13'89"	2535450	728876	UK	135.2	6.99	-135	25.2	71.2	0.50	0.33	
11	2002/1/19	SS-KK-03-11	22 54'69"	89 13'90"	2535465	728893	79.2	128.4	6.99	-132	26.3	73.4	0.60		
12	2002/1/19	SS-KK-03-12	22 54'68"	89 13'98"	2535448	728914	UK	132.1	7.17	-125	25.2	81.2	0.70		
13	2002/1/19	SS-KK-03-13	22 54'72"	89 13'87"	2535506	728852	UK	128.9	7.09	-129	25.9	76.7	0.60		
14	2002/1/19	SS-KK-03-14	22 54'70"	89 13'87"	2535484	728849	UK	127.0	7.14	-133	25.1	73.3	0.70		
15	2002/1/19	SS-KK-03-15	22 54'71"	89 13'88"	2535491	728860	53.3	126.0	7.13	-137	25.6	68.9	0.70		
16	2002/1/19	SS-KK-03-16	22 54'72"	89 13'89"	2535513	728870	UK	135.3	7.09	-134	25.6	71.9	0.60		
17	2002/1/20	SS-KK-03-17	22 54'72"	89 13'93"	2535518	728944	61.0	128.2	7.01	-113	25.1	93.3	0.60		
18	2002/1/20	SS-KK-03-18	22 54'72"	89 13'94"	2535523	728955	UK	134.4	7.07	-116	25.7	89.9	0.50		
19	2002/1/20	SS-KK-03-19	22 54'72"	89 13'99"	2535524	729055	48.8	136.0	7.08	-107	25.6	98.9	0.10		
20	2002/1/20	SS-KK-03-20	22 54'75"	89 14'02"	2535575	729094	56.4	137.9	7.08	-127	25.9	78.7	0.60	0.35	
21	2002/1/20	SS-KK-03-21	22 54'75"	89 14'03"	2535582	729114	56.4	135.7	7.19	-128	25.9	77.7	0.60		
22	2002/1/20	SS-KK-03-22	22 54'69"	89 13'95"	2535474	728980	56.4	133.5	7.11	-135	25.1	71.3	0.70		
23	2002/1/20	SS-KK-03-23	22 54'69"	89 13'95"	2535462	728989	54.9	138.8	7.08	-140	25.4	66.1	0.70		
24	2002/1/20	SS-KK-03-24	22 54'69"	89 13'97"	2535466	729009	UK	134.8	7.04	-135	25.6	70.9	0.70		
25	2002/1/20	SS-KK-03-25	22 54'71"	89 14'00"	2535501	729058	UK	128.6	7.09	-136	26.3	69.4	0.60		
26	2002/1/20	SS-KK-03-26	22 54'67"	89 14'02"	2535421	729107	56.4	135.6	7.09	-132	25.7	73.9	0.50		
27	2002/1/20	SS-KK-03-27	22 54'66"	89 14'09"	2535416	729137	UK	146.1	6.98	-126	25.3	80.2	0.40		
28	2002/1/21	SS-KK-03-28	22 54'71"	89 14'04"	2535499	729131	61.0	127.8	6.98	-95	25.3	111.2	0.40		
29	2002/1/21	SS-KK-03-29	22 54'63"	89 14'07"	2535366	729182	56.4	139.2	7.01	-116	25.6	89.9	0.60		
30	2002/1/21	SS-KK-03-30	22 54'62"	89 14'03"	2535340	729111	53.3	145.1	7.01	-132	25.3	74.2	0.50	0.33	
31	2002/1/21	SS-KK-03-31	22 54'63"	89 14'17"	2535347	729348	59.4	163.7	7.08	-131	25.5	75.0	0.60		
32	2002/1/21	SS-KK-03-32	22 54'64"	89 14'18"	2535385	729367	68.6	170.8	6.94	-129	25.8	76.8	0.50		
33	2002/1/21	SS-KK-03-33	22 54'65"	89 14'19"	2535397	729387	UK	175.2	7.01	-129	25.7	76.9	0.60		
34	2002/1/21	SS-KK-03-34	22 54'66"	89 14'20"	2535411	729411	54.9	180.8	6.98	-127	25.6	78.9	0.50		
35	2002/1/21	SS-KK-03-35	22 54'68"	89 14'65"	2535398	729523	85.3	147.0	7.08	-136	25.7	69.9	0.60		
36	2002/1/21	SS-KK-03-36	22 54'68"	89 14'29"	2535453	729568	67.1	168.0	7.03	-139	25.6	66.9	0.50		
37	2002/1/21	SS-KK-03-37	22 54'69"	89 14'27"	2535474	729530	61.0	184.5	7.02	-137	25.3	69.2	0.60		
38	2002/1/21	SS-KK-03-38	22 54'68"	89 14'24"	2535447	729481	56.4	158.5	6.98	-134	25.2	72.2	0.50		
39	2002/1/21	SS-KK-03-39	22 54'71"	89 14'27"	2535509	729532	UK	161.6	7.03	-132	25.7	73.9	0.60		
40	2002/1/21	SS-KK-03-40	22 54'76"	89 14'32"	2535605	729612	56.4	164.9	7.02	-138	25.8	67.8	0.60	0.36	
41	2002/1/22	SS-KK-03-41	22 55'75"	89 14'33"	2535574	729635	79.2	154.8	7.03	-118	25.9	87.7	0.60		
42	2002/1/22	SS-KK-03-42	22 55'73"	89 14'37"	2535546	729696	54.9	181.9	7.05	-124	25.3	82.2	0.50		
43	2002/1/22	SS-KK-03-43	22 55'72"	89 14'39"	2535535	729725	91.4	232.0	7.29	-112	25.7	93.9	0.60		
44	2002/1/22	SS-KK-03-44	22 55'69"	89 14'36"	2535473	729686	56.4	179.5	6.95	-112	25.8	93.8	0.60		
45	2002/1/22	SS-KK-03-45	22 55'68"	89 14'36"	2535447	729674	UK								Unused
46	2002/1/22	SS-KK-03-46	22 55'66"	89 14'35"	2535410	729669	94.5	157.2	7.16	-108	25.6	97.9	0.60		
47	2002/1/22	SS-KK-03-47	22 55'69"	89 14'32"	2535456	729617	64.0	162.4	7.15	-125	25.6	80.9	0.60		
48	2002/1/22	SS-KK-03-48	22 55'63"	89 14'32"	2535386	729624	61.0	165.1	7.12	-127	25.6	78.9	0.50		
49	2002/1/22	SS-KK-03-49	22 55'72"	89 14'41"	2535518	729776	47.2	174.7	7.00	-109	25.6	96.9	0.60		
50	2002/1/22	SS-KK-03-50	22 55'70"	89 14'44"	2535496	729819	56.4	175.9	7.21	-123	25.5	83.0	0.50	0.35	
51	2002/1/22	SS-KK-03-51	22 55'69"	89 14'45"	2535475	729827	76.2								Unused
52	2002/1/22	SS-KK-03-52	22 55'71"	89 14'45"	2535508	729856	UK	175.2	7.18	-123	25.4	83.1	0.60		
53	2002/1/22	SS-KK-03-53	22 55'71"	89 14'44"	2535521	729822	UK	171.0	7.13	-132	25.6	73.9	0.60		
54	2002/1/23	SS-KK-03-54	22 54'90"	89 14'54"	2535858	729971	UK	177.0	7.15	-108	25.3	98.2	0.60		
55	2002/1/23	SS-KK-03-55	22 54'88"	89 14'52"	2535836	729958	56.4	177.0	7.11	-112	25.6	93.9	0.70		
56	2002/1/23	SS-KK-03-56	22 54'87"	89 14'54"	2535809	729979	56.4	193.7	7.13	-117	25.1	89.3	0.60		
57	2002/1/23	SS-KK-03-57	22 54'88"	89 14'54"	2535826	729991	UK	189.3	7.19	-128	25.5	78.0	0.60		
58	2002/1/23	SS-KK-03-58	22 54'85"	89 14'57"	2535768	730023	85.3	181.5	7.18	-113	25.2	93.2	0.50		
59	2002/1/23	SS-KK-03-59	22 54'79"	89 14'55"	2535720	729992	64.0								Unused
60	2002/1/23	SS-KK-03-60	22 54'83"	89 14'56"	2535732	730029	56.4	174.1	7.13	-127	25.0	79.4	0.60	0.32	
61	2002/1/23	SS-KK-03-61	22 54'80"	89 14'59"	2535692	730075	UK	198.3	7.07	-126	25.1	80.3	0.60		
62	2002/1/23	SS-KK-03-62	22 54'82"	89 14'60"	2535727	730080	48.8	198.4	7.04	-130	24.7	76.6	0.50		
63	2002/1/23	SS-KK-03-63	22 54'79"	89 14'56"	2535665	730020	UK								Unused
64	2002/1/23	SS-KK-03-64	22 54'74"	89 14'53"	2535567	729969	UK	182.1	7.09	-132	24.9	74.4	0.60		
65	2002/2/14	SS-KK-03-65	22 54'42"	89 14'08"	2535474	729280	56.4	140.0	7.05	-108	25.1	98.3	0.70		
66	2002/2/14	SS-KK-03-66	22 54'41"	89 14'09"	2535471	729318	57.9	158.5	7.03	-110	25.0	96.4	0.50		

Table 3.2.5 Results of Screening Survey (Maguradanga: No.1 to No. 89)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/19	SS-MG-02-01	22 54'38"	89 13'42"	2535382	730271	30.5	222.0	7.07	-218	26.3	-12.6	0.30		
2	2002/1/19	SS-MG-02-02	22 54'40"	89 13'43"	2535452	730282	47.2	230.0	7.14	-231	26.0	-25.4	0.50		
3	2002/1/19	SS-MG-02-03	22 54'40"	89 13'44"	2535427	730311	47.2	239.0	7.20	-240	25.9	-34.3	0.30		
4	2002/1/19	SS-MG-02-04	22 54'40"	89 13'45"	2535434	730341	56.4	233.0	7.24	-237	25.9	-31.3	0.50		
5	2002/1/19	SS-MG-02-05	22 54'41"	89 13'46"	2535468	730389	50.3	242.0	7.01	-233	25.4	-26.9	0.30		
6	2002/1/19	SS-MG-02-06	22 54'41"	89 13'48"	2535455	730433	45.7	245.0	7.18	-233	25.5	-27.0	0.60		
7	2002/1/19	SS-MG-02-07	22 54'40"	89 13'49"	2535441	730460	53.3	244.0	7.18	-233	25.6	-27.1	0.60		
8	2002/1/19	SS-MG-02-08	22 54'41"	89 13'49"	2535474	730463	74.7	232.0	7.26	-234	25.9	-28.3	0.60		
9	2002/1/19	SS-MG-02-09	22 54'41"	89 13'49"	2535490	730456	56.4	252.0	7.16	-240	25.9	-34.3	0.50		
10	2002/1/19	SS-MG-02-10	22 54'41"	89 13'50"	2535450	730484	61.0	250.0	7.17	-243	25.9	-37.3	0.60	0.43	
11	2002/1/19	SS-MG-04-01	22 54'39"	89 14'41"	2535408	730236	64.0	231.0	7.11	-104	25.9	101.7	0.70		
12	2002/1/19	SS-MG-04-02	22 54'41"	89 14'41"	2535467	730241	51.8	223.0	7.12	-81	25.2	125.2	0.50		
13	2002/1/19	SS-MG-04-03	22 54'41"	89 14'40"	2535471	730198	42.7	218.0	6.98	-102	25.2	104.2	0.70		
14	2002/1/19	SS-MG-04-04	22 54'42"	89 14'39"	2535489	730181	56.4	216.0	7.01	-119	25.5	87.0	0.60		
15	2002/1/19	SS-MG-04-05	22 54'42"	89 14'38"	2535472	730159	54.9	207.0	7.02	-122	24.9	84.4	0.60		
16	2002/1/19	SS-MG-04-06	22 54'40"	89 14'39"	2535440	730171	51.8	193.2	6.98	-126	25.7	79.9	0.80		
17	2002/1/19	SS-MG-04-07	22 54'42"	89 14'35"	2535504	730077	51.8	104.8	7.05	-115	25.4	91.1	0.70		
18	2002/1/20	SS-MG-02-11	22 54'40"	89 14'51"	2535453	730515	51.8	246.0	7.18	-225	25.6	-19.1	0.50		
19	2002/1/20	SS-MG-02-12	22 54'42"	89 14'50"	2535489	730502	51.8	244.0	7.27	-232	25.6	-26.1	0.60		
20	2002/1/20	SS-MG-02-13	22 54'43"	89 14'44"	2535533	730317	50.3	224.0	7.11	-231	25.6	-25.1	0.50		
21	2002/1/20	SS-MG-02-14	22 54'48"	89 14'41"	2535673	730226	56.4	214.0	7.27	-245	25.7	-39.1	0.40		
22	2002/1/20	SS-MG-02-15	22 54'48"	89 14'40"	2535683	730216	61.0	222.0	7.22	-239	25.7	-33.1	0.20		
23	2002/1/20	SS-MG-02-16	22 54'48"	89 14'40"	2535696	730195	67.1	216.0	7.18	-230	25.8	-24.2	0.40		
24	2002/1/20	SS-MG-02-17	22 54'50"	89 14'42"	2535741	730269	51.8	125.0	7.27	-245	25.6	-39.1	0.40		
25	2002/1/20	SS-MG-02-18	22 54'51"	89 14'42"	2535773	730267	64.0	217.0	7.21	-244	25.7	-38.1	0.08		
26	2002/1/20	SS-MG-02-19	22 54'51"	89 14'42"	2535777	730263	56.4	216.0	7.18	-233	25.8	-27.2	0.50		
27	2002/1/20	SS-MG-02-20	22 54'54"	89 14'39"	2535865	730264	50.3	223.0	7.27	-210	25.6	-4.1	0.60	0.37	
28	2002/1/20	SS-MG-02-21	22 54'53"	89 14'37"	2535824	730104	UK	195.1	7.25	-224	25.4	-17.9	0.60		
29	2002/1/20	SS-MG-02-22	22 54'45"	89 14'45"	2535605	730357	51.8	235.0	7.20	-235	25.4	-28.9	0.60		
30	2002/1/20	SS-MG-02-23	22 54'45"	89 14'46"	2535604	730385	53.6	237.0	7.18	-233	25.3	-26.8	0.20		
31	2002/1/20	SS-MG-04-08	22 54'42"	89 14'33"	2535483	730004	53.3	191.8	7.01	-102	25.0	104.4	0.50		
32	2002/1/20	SS-MG-04-09	22 54'41"	89 14'33"	2535463	729991	57.9	198.8	7.06	-70	24.9	136.4	0.40		
33	2002/1/20	SS-MG-04-10	22 54'40"	89 14'34"	2535430	730035	61.0	180.9	7.13	-108	24.7	98.6	0.50	0.28	
34	2002/1/20	SS-MG-04-11	22 54'38"	89 14'34"	2535377	730077	42.7	204.0	7.03	-106	25.4	100.1	0.60		
35	2002/1/20	SS-MG-04-12	22 54'37"	89 14'37"	2535329	730072	41.1	198.7	7.11	-113	25.1	93.3	0.50		
36	2002/1/20	SS-MG-04-13	22 54'40"	89 14'30"	2535427	729927	51.8	94.2	7.11	-101	25.8	104.8	0.70		
37	2002/1/20	SS-MG-04-14	22 54'40"	89 14'31"	2535440	729940	56.4	187.4	7.26	-109	25.2	97.2	0.50		
38	2002/1/20	SS-MG-04-15	22 54'41"	89 14'31"	2535459	729950	41.1	195.2	7.04	-136	25.2	70.2	0.70		
39	2002/1/20	SS-MG-04-16	22 54'39"	89 14'28"	2535409	729865	56.4	179.2	7.07	-102	25.4	104.1	0.60		
40	2002/1/20	SS-MG-04-17	22 54'39"	89 14'29"	2535384	729829	51.8	177.0	6.97	-110	24.8	96.5	0.30		
41	2002/1/20	SS-MG-04-18	22 54'39"	89 14'27"	2535395	729823	61.0	178.3	7.25	-110	25.7	95.9	0.50		
42	2002/1/20	SS-MG-04-19	22 54'40"	89 14'25"	2535445	729787	56.4	189.4	7.00	-104	25.2	102.2	0.30		
43	2002/1/20	SS-MG-04-20	22 54'39"	89 14'24"	2535287	729755	41.1	156.8	7.19	-108	25.4	98.1	0.60	0.35	
44	2002/1/20	SS-MG-04-21	22 54'39"	89 14'23"	2535383	729712	56.4	168.9	7.08	-96	25.5	110.0	0.50		
45	2002/1/21	SS-MG-02-24	22 54'49"	89 14'46"	2535715	730379	54.9	241.0	7.09	-217	25.5	-11.0	0.30		
46	2002/1/21	SS-MG-02-25	22 54'49"	89 14'47"	2535726	730409	42.7	238.0	7.18	-218	25.4	-11.9	0.30		
47	2002/1/21	SS-MG-02-26	22 54'49"	89 14'48"	2535702	730429	47.2	243.0	7.22	-238	25.9	-32.3	0.50		
48	2002/1/21	SS-MG-02-27	22 54'51"	89 14'49"	2535792	730444	UK	236.0	7.10	-224	25.8	-18.2	0.70		
49	2002/1/21	SS-MG-02-28	22 54'52"	89 14'49"	2535813	730445	51.8	231.0	7.13	-241	25.9	-35.3	0.80		
50	2002/1/21	SS-MG-02-29	22 54'53"	89 14'48"	2535834	730436	56.4	231.0	7.14	-233	26.0	-27.4	0.60		
51	2002/1/21	SS-MG-02-30	22 54'57"	89 14'33"	2535964	730025	47.2	184.0	7.29	-225	25.9	-19.3	0.70	0.32	
52	2002/1/21	SS-MG-02-31	22 54'56"	89 14'33"	2535937	729988	45.7	186.0	7.22	-229	25.9	-23.3	0.70		
53	2002/1/22	SS-MG-04-22	22 54'38"	89 14'21"	2535365	729657	47.2	168.9	7.16	-76	25.0	130.4	0.60		
54	2002/1/22	SS-MG-04-23	22 54'37"	89 14'21"	2535332	729657	56.4	170.6	7.24	-79	24.7	127.6	0.50		
55	2002/1/22	SS-MG-04-24	22 54'36"	89 14'21"	2535301	729668	62.5	165.8	7.13	-69	25.5	137.0	0.60		
56	2002/1/22	SS-MG-04-25	22 54'36"	89 14'21"	2535306	729666	67.1	160.7	7.21	-76	25.0	130.4	0.40		
57	2002/1/22	SS-MG-04-26	22 54'35"	89 14'21"	2535274	729671	47.2	167.6	7.14	-59	25.9	146.7	0.50		
58	2002/1/22	SS-MG-04-27	22 54'36"	89 14'19"	2535308	729603	51.8	167.8	7.13	-65	25.6	140.9	0.50		

Table 3.2.5 Results of Screening Survey (Maguradanga: No.1 to No. 89)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
59	2002/1/22	SS-MG-04-28	22 54'37"	89 14'19"	2535334	729599	59.4	115.2	7.19	-106	25.5	100.0	0.60		
60	2002/1/22	SS-MG-04-29	22 54'32"	89 14'19"	2535185	729598	UK	253.0	7.38	-71	25.0	135.4	0.50		
61	2002/1/22	SS-MG-04-30	22 54'26"	89 14'18"	2535009	729572	61.3	176.1	7.16	-76	25.1	130.3	0.50	0.31	
62	2002/1/22	SS-MG-04-31	22 54'25"	89 14'16"	2534962	729522	56.4	174.4	7.05	-93	25.5	113.0	0.40		
63	2002/1/22	SS-MG-04-32	22 54'25"	89 14'21"	2534969	729579	52.4	174.4	7.07	-82	25.7	123.9	0.50		
64	2002/1/22	SS-MG-04-33	22 54'25"	89 14'20"	2534963	729656	51.8	132.5	7.04	-79	25.2	127.2	0.30		
65	2002/1/22	SS-MG-04-34	22 54'26"	89 14'21"	2534994	729658	56.4	94.8	6.92	-56	25.4	150.1	0.40		
66	2002/1/22	SS-MG-04-35	22 54'26"	89 14'19"	2535000	729619	57.9								Unused
67	2002/1/22	SS-MG-04-36	22 54'28"	89 14'18"	2535063	729598	56.4	176.2	7.10	-65	25.3	141.2	0.60		
68	2002/1/23	SS-MG-04-37	22 54'28"	89 14'19"	2535068	729622	47.2	187.6	7.01	-86	24.7	120.6	0.60		
69	2002/1/23	SS-MG-04-38	22 54'29"	89 14'22"	2535095	729698	59.4	183.8	7.23	-96	24.7	110.6	0.60		
70	2002/1/23	SS-MG-04-39	22 54'29"	89 14'20"	2535094	729639	51.8	174.2	7.20	-106	24.8	100.5	0.60		
71	2002/1/23	SS-MG-04-40	22 54'29"	89 14'16"	2535098	729536	47.2	198.1	7.01	-80	24.1	127.0	0.30	0.19	
72	2002/1/23	SS-MG-04-41	22 54'28"	89 14'16"	2535061	729534	70.1								Unused
73	2002/1/23	SS-MG-04-42	22 54'30"	89 14'17"	2535116	729569	56.4	168.6	7.16	-89	25.0	117.4	0.50		
74	2002/1/23	SS-MG-04-43	22 54'31"	89 14'17"	2535143	729560	51.8	172.0	7.23	-97	25.2	109.2	0.50		
75	2002/1/23	SS-MG-04-44	22 54'30"	89 14'17"	2535123	729573	56.4	172.8	7.23	-84	24.1	123.0	0.40		
76	2002/1/23	SS-MG-04-45	22 54'33"	89 14'15"	2535207	729505	67.1	157.9	7.50	-87	24.4	119.8	0.60		
77	2002/1/23	SS-MG-04-46	22 54'33"	89 14'16"	2535215	729517	67.1	157.9	7.50	-87	24.4	119.8	0.60		
78	2002/1/23	SS-MG-04-47	22 54'33"	89 14'15"	2535218	729498	61.0	193.4	7.22	-108	24.7	98.6	0.50		
79	2002/1/23	SS-MG-04-48	22 54'33"	89 14'15"	2535216	729495	50.3	128.6	7.15	-98	24.3	108.9	0.70		
80	2002/1/23	SS-MG-04-49	22 54'33"	89 14'14"	2535222	729472	51.8	160.2	7.11	-111	24.9	95.4	0.50		
81	2002/1/23	SS-MG-04-50	22 54'33"	89 14'14"	2535215	729447	38.1	157.2	6.99	-107	25.0	99.4	0.50	0.22	
82	2002/1/24	SS-MG-04-51	22 54'34"	89 14'14"	2535242	729481	74.7	102.1	7.25	-125	24.1	82.0	0.60		
83	2002/1/24	SS-MG-04-52	22 54'34"	89 14'14"	2535241	729463	61.0	83.2	7.24	-109	25.0	97.4	0.80		
84	2002/1/24	SS-MG-04-53	22 54'35"	89 14'11"	2535276	729388	61.0	144.6	7.25	-112	24.8	94.5	0.60		
85	2002/1/24	SS-MG-04-54	22 54'35"	89 14'09"	2535265	729326	62.5	155.8	7.18	-93	24.7	113.6	0.50		
86	2002/1/24	SS-MG-04-55	22 54'36"	89 14'09"	2535272	729296	61.0	149.9	7.01	-87	25.0	119.4	0.50		
87	2002/1/24	SS-MG-04-56	22 54'36"	89 14'09"	2535298	729318	UK	84.4	6.99	-129	24.8	77.5	0.60		
88	2002/1/24	SS-MG-04-57	22 54'37"	89 14'04"	2535327	729180	38.1	167.5	6.92	-113	24.4	93.8	0.40		
89	2002/1/24	SS-MG-04-58	22 54'37"	89 14'06"	2535318	729224	51.8	162.7	6.97	-122	24.7	84.6	0.50	0.32	

Table 3.2.6 Results of Screening Survey (Baliadanga: No.1 to No.303)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/21	SS-BL-01-01	22 54'32"	89 13'21"	2535159	727949	51.8	112.0	7.17	-92	23.2	115.7	0.40		
2	2002/1/21	SS-BL-01-02	22 54'29"	89 13'21"	2535075	727934	UK	154.6	6.96	-70	22.4	138.2	0.40		
3	2002/1/21	SS-BL-01-03	22 54'29"	89 13'20"	2535059	727937	UK	163.6	6.98	-86	23.3	121.6	0.20		
4	2002/1/21	SS-BL-01-04	22 54'29"	89 13'20"	2535086	727941	53.3	96.6	7.12	-104	23.2	103.7	0.50		
5	2002/1/21	SS-BL-01-05	22 54'29"	89 13'20"	2535076	727937	47.2	108.7	7.00	-94	23.6	113.4	0.50		
6	2002/1/21	SS-BL-01-06	22 54'30"	89 13'19"	2535086	727907	UK	101.1	7.12	-114	24.2	92.9	0.60		
7	2002/1/21	SS-BL-01-07	22 54'32"	89 13'21"	2535146	727962	UK	116.2	7.16	-101	24.3	105.9	0.40		
8	2002/1/21	SS-BL-01-08	22 54'33"	89 13'21"	2535177	727945	UK								Unused
9	2002/1/21	SS-BL-01-09	22 54'31"	89 13'20"	2535112	727935	48.8	106.6	7.21	-97	23.7	110.3	0.40		
10	2002/1/21	SS-BL-01-10	22 54'31"	89 13'23"	2535132	728014	UK	119.3	7.25	-112	24.7	94.6	0.40	0.34	
11	2002/1/21	SS-BL-05-01	22 54'35"	89 13'20"	2535256	727934	UK	113.5	7.12	-135	23.4	72.5	0.50	0.24	
12	2002/1/21	SS-BL-05-02	22 54'37"	89 13'18"	2535316	727864	50.3	100.4	7.16	-128	25.8	77.8	0.50		
13	2002/1/21	SS-BL-05-03	22 54'38"	89 13'19"	2535328	727873	50.3	116.7	7.30	-134	26.2	71.5	0.60		
14	2002/1/21	SS-BL-05-04	22 54'38"	89 13'18"	2535332	727862	50.3	116.2	7.24	-140	25.8	65.8	0.60		
15	2002/1/21	SS-BL-05-05	22 54'38"	89 13'18"	2535326	727858	50.3	85.1	7.27	-131	25.4	75.1	0.50		
16	2002/1/21	SS-BL-05-06	22 54'37"	89 13'19"	2535310	727912	50.3	115.3	7.21	-136	25.6	69.9	0.60		
17	2002/1/21	SS-BL-05-07	22 54'38"	89 13'19"	2535335	727894	UK	90.5	7.27	-135	25.8	70.8	0.50		
18	2002/1/21	SS-BL-05-08	22 54'38"	89 13'19"	2535352	727895	51.8	109.1	7.20	-138	25.8	67.8	0.60		
19	2002/1/21	SS-BL-05-09	22 54'39"	89 13'19"	2535355	727896	50.3	108.4	7.24	-125	25.7	80.9	0.60		
20	2002/1/21	SS-BL-05-10	22 54'38"	89 13'20"	2535350	727823	42.7	109.9	7.22	-131	25.4	75.1	0.60		
21	2002/1/21	SS-BL-05-11	22 54'38"	89 13'21"	2535360	727932	54.9	120.5	7.29	-131	25.7	74.9	0.60	0.28	
22	2002/1/22	SS-BL-05-12	22 54'38"	89 14'21"	2535329	727950	77.7	121.8	6.82	-116	25.8	89.8	0.60		
23	2002/1/22	SS-BL-05-13	22 54'38"	89 14'21"	2535333	727965	50.3	125.3	6.93	-130	25.5	76.0	0.50		
24	2002/1/22	SS-BL-05-14	22 54'39"	89 14'22"	2535364	727971	45.7	113.7	6.90	-134	24.7	72.6	0.60		
25	2002/1/22	SS-BL-05-15	22 54'38"	89 14'22"	2535341	727979	51.8	124.7	7.03	-134	25.3	72.2	0.40		
26	2002/1/22	SS-BL-05-16	22 54'38"	89 14'22"	2535350	727995	51.8	126.6	7.00	-131	25.1	75.3	0.50		
27	2002/1/22	SS-BL-05-17	22 54'39"	89 14'21"	2535376	727892	50.3	106.3	7.04	-142	25.5	64.0	0.60		
28	2002/1/22	SS-BL-05-18	22 54'40"	89 14'19"	2535391	727899	97.5	108.6	7.14	-117	25.6	88.9	0.50		
29	2002/1/22	SS-BL-05-19	22 54'40"	89 14'19"	2535414	727890	61.0	104.3	7.01	-144	25.5	62.0	0.60		
30	2002/1/22	SS-BL-05-20	22 54'39"	89 14'18"	2535380	727878	54.9	113.7	7.01	-158	25.5	48.0	0.60		
31	2002/1/22	SS-BL-05-21	22 54'40"	89 14'18"	2535386	727877	54.9	104.7	7.00	-141	25.5	65.0	0.50	0.27	
32	2002/1/22	SS-BL-05-22	22 54'41"	89 14'18"	2535434	727873	65.2	109.2	7.07	-134	25.3	72.2	0.50		
33	2002/1/22	SS-BL-05-23	22 54'41"	89 14'18"	2535436	727863	50.3	104.7	7.00	-145	25.3	61.2	0.60		
34	2002/1/23	SS-BL-05-24	22 54'39"	89 13'23"	2535371	727990	45.7	49.8	7.06	-108	24.8	98.5	0.60		
35	2002/1/23	SS-BL-05-25	22 54'71"	89 13'23"	2535423	728008	50.3	144.6	6.96	-123	25.5	83.0	0.60		
36	2002/1/23	SS-BL-05-26	22 54'39"	89 13'22"	2535377	727994	45.7	44.9	6.97	-138	24.5	68.7	0.60		
37	2002/1/23	SS-BL-05-27	22 54'39"	89 13'23"	2535371	727989	48.8	100.3	7.03	-140	25.1	66.3	0.70		
38	2002/1/23	SS-BL-05-28	22 54'39"	89 13'22"	2535376	727989	45.7	108.8	6.90	-138	25.3	68.2	0.50		
39	2002/1/23	SS-BL-05-29	22 54'40"	89 13'21"	2535391	727967	62.5	101.5	7.04	-140	25.4	66.1	0.50		
40	2002/1/23	SS-BL-05-30	22 54'40"	89 13'21"	2535401	727967	61.0	47.7	7.07	-140	24.9	66.4	0.50	0.27	
41	2002/1/23	SS-BL-05-31	22 54'40"	89 13'21"	2535410	727967	UK								Unused
42	2002/1/23	SS-BL-05-32	22 54'39"	89 13'21"	2535374	727949	UK								Unused
43	2002/1/23	SS-BL-05-33	22 54'40"	89 13'20"	2535396	727938	54.9	112.0	7.07	-136	25.5	70.0	0.50		
44	2002/1/23	SS-BL-05-34	22 54'40"	89 13'20"	2535396	727934	45.7	103.1	7.07	-138	24.8	68.5	0.50		
45	2002/1/23	SS-BL-05-35	22 54'41"	89 13'26"	2535426	727954	45.7	44.5	7.10	-127	24.5	79.7	0.50		
46	2002/1/23	SS-BL-05-36	22 54'41"	89 13'22"	2535425	727969	50.3	44.5	7.10	-128	24.5	78.7	0.60		
47	2002/1/23	SS-BL-05-37	22 54'41"	89 13'19"	2535437	727902	45.7	104.0	7.14	-124	24.8	82.5	0.60		
48	2002/1/23	SS-BL-05-38	22 54'42"	89 13'20"	2535457	727913	54.9	97.1	7.07	-137	24.8	69.5	0.60		
49	2002/1/23	SS-BL-05-39	22 54'42"	89 13'19"	2535469	727907	54.9	94.1	7.07	-131	25.2	75.2	0.50		
50	2002/1/23	SS-BL-05-40	22 54'43"	89 13'19"	2535467	727903	54.9	100.0	7.10	-128	24.9	78.4	0.50	0.23	
51	2002/1/23	SS-BL-05-41	22 54'42"	89 13'19"	2535472	727891	54.9	90.0	7.10	-129	24.7	77.6	0.50		
52	2002/1/23	SS-BL-05-42	22 54'45"	89 13'19"	2535542	727889	50.3	97.6	7.08	-131	25.1	75.3	0.50		
53	2002/1/23	SS-BL-05-43	22 54'45"	89 13'17"	2535551	727828	51.8	110.7	7.12	-113	25.5	93.0	0.50		
54	2002/1/22	SS-BL-01-11	22 54'33"	89 13'19"	2535177	727894	47.2	97.7	7.11	-105	24.3	101.9	0.30		
55	2002/1/22	SS-BL-01-12	22 54'34"	89 13'19"	2535219	727902	UK	115.3	7.04	-79	23.2	128.7	0.30		
56	2002/1/22	SS-BL-01-13	22 54'34"	89 13'20"	2535204	727914	100.6	98.6	7.06	-102	22.3	106.3	0.40		
57	2002/1/22	SS-BL-01-14	22 54'33"	89 13'19"	2535192	727915	35.1	108.3	7.09	-86	23.3	121.6	0.40		
58	2002/1/22	SS-BL-01-15	22 54'32"	89 13'20"	2535155	727921	44.2	106.2	7.18	-102	23.7	105.3	0.30		
59	2002/1/22	SS-BL-01-16	22 54'30"	89 13'24"	2535095	728027	UK	103.1	7.10	-75	23.9	132.2	0.50		
60	2002/1/22	SS-BL-01-17	22 54'29"	89 13'24"	2535069	728036	86.9	99.9	7.15	-98	23.3	109.6	0.60		
61	2002/1/22	SS-BL-01-18	22 54'29"	89 13'21"	2535059	727966	93.0	96.1	7.17	-102	25.2	104.2	0.40		
62	2002/1/22	SS-BL-01-19	22 54'30"	89 13'27"	2535095	728138	UK	128.6	7.05	-90	25.5	116.0	0.40		
63	2002/1/22	SS-BL-01-20	22 54'30"	89 13'26"	2535088	728102	50.3	109.5	7.04	-87	22.6	121.1	0.50	0.24	

Table 3.2.6 Results of Screening Survey (Baliadanga: No.1 to No.303)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
64	2002/1/22	SS-BL-01-21	22 54'27"	89 13'27"	2535005	728145	51.8	117.2	7.08	-102	20.5	107.6	0.40		
65	2002/1/22	SS-BL-01-22	22 54'28"	89 13'27"	2535039	728133	UK	114.6	7.12	-100	20.3	109.8	0.50		
66	2002/1/22	SS-BL-01-23	22 54'27"	89 13'28"	2534993	728160	57.9	111.9	7.19	-108	19.7	102.2	0.50		
67	2002/1/22	SS-BL-01-24	22 54'26"	89 13'28"	2534980	728157	54.9	116.2	6.84	-105	21.2	104.1	0.50		
68	2002/1/23	SS-BL-01-25	22 54'26"	89 13'29"	2534966	728185	91.4	108.5	6.88	-92	21.4	117.0	0.30		
69	2002/1/23	SS-BL-01-26	22 54'25"	89 13'29"	2534938	728191	57.9	116.8	7.01	-106	21.2	103.1	0.30		
70	2002/1/23	SS-BL-01-27	22 54'26"	89 13'27"	2534988	728140	56.4	107.3	7.19	-105	22.3	103.3	0.30		
71	2002/1/23	SS-BL-01-28	22 54'26"	89 13'26"	2534984	728100	65.5	118.2	7.15	-102	19.7	108.2	0.40		
72	2002/1/23	SS-BL-01-29	22 54'25"	89 13'27"	2534943	728122	62.5	115.5	7.18	-109	19.7	101.2	0.30		
73	2002/1/23	SS-BL-01-30	22 54'25"	89 13'25"	2534949	728085	UK	114.0	7.13	-104	19.4	106.4	0.50	0.25	
74	2002/1/23	SS-BL-01-31	22 54'25"	89 13'25"	2534925	728076	UK	118.0	7.13	-106	20.3	103.8	0.30		
75	2002/1/23	SS-BL-01-32	22 54'25"	89 13'25"	2534940	728065	56.4	108.5	7.22	-105	19.5	105.3	0.40		
76	2002/1/23	SS-BL-01-33	22 54'25"	89 13'24"	2534930	728043	51.8	130.5	7.09	-98	19.5	112.3	0.30		
77	2002/1/23	SS-BL-01-34	22 54'26"	89 13'23"	2534955	728013	61.0	102.6	7.21	-103	20.1	106.9	0.50		
78	2002/1/23	SS-BL-01-35	22 54'25"	89 13'22"	2534935	728997	48.8	102.9	7.21	-103	20.2	106.8	0.50		
79	2002/1/23	SS-BL-01-36	22 54'24"	89 13'23"	2534917	728024	UK	101.4	7.19	-102	19.7	108.2	0.60		
80	2002/1/24	SS-BL-01-37	22 54'24"	89 13'22"	2534898	727998	35.1	123.3	7.20	-113	21.8	95.7	0.40		
81	2002/1/23	SS-BL-01-38	22 54'24"	89 13'22"	2534914	727986	71.6	139.3	7.03	-98	21.2	111.1	0.20		
82	2002/1/24	SS-BL-01-39	22 54'26"	89 13'19"	2534950	727889	48.8	123.0	7.12	-102	22.4	106.2	0.40	0.17	
83	2002/1/24	SS-BL-01-40	22 54'26"	89 13'19"	2534980	727911	47.2	112.0	7.14	-106	22.7	102.0	0.50		
84	2002/1/24	SS-BL-01-41	22 54'23"	89 13'22"	2534875	728002	UK	105.7	7.17	-108	23.2	99.7	0.40		
85	2002/1/24	SS-BL-01-42	22 54'22"	89 13'22"	2534862	728003	UK	105.7	7.17	-112	23.2	95.7	0.30		
86	2002/1/24	SS-BL-01-43	22 54'22"	89 13'23"	2534886	728033	UK	103.7	7.01	-121	23.2	86.7	0.40		
87	2002/1/24	SS-BL-01-44	22 54'22"	89 13'25"	2534847	728063	UK	117.4	7.05	-102	19.5	108.3	0.50		
88	2002/1/24	SS-BL-01-45	22 54'20"	89 13'24"	2534798	728047	57.9	102.6	7.11	-100	21.5	108.9	0.30		
89	2002/1/24	SS-BL-01-46	22 54'22"	89 13'26"	2534861	728107	51.8	109.7	7.12	-109	20.1	100.9	0.30		
90	2002/1/24	SS-BL-01-47	22 54'22"	89 13'27"	2534840	728113	51.8	120.9	6.93	-113	22.3	95.3	0.50		
91	2002/1/24	SS-BL-01-48	22 54'24"	89 13'27"	2534911	728133	54.9	126.8	7.12	-105	19.5	105.3	0.50		
92	2002/1/26	SS-BL-01-49	22 54'25	89 13'29"	2534947	728188	UK								Unused
93	2002/1/24	SS-BL-01-50	22 54'24"	89 13'29"	2534907	728205	UK	122.6	7.13	-109	20.3	100.8	0.40	0.21	
94	2002/1/24	SS-BL-01-51	22 54'23"	89 13'28"	2534889	728174	UK	117.9	7.21	-103	20.1	106.9	0.50		
95	2002/1/24	SS-BL-01-52	22 54'22"	89 13'28"	2534859	728152	UK	117.5	7.02	-118	20.2	91.8	0.40		
96	2002/1/24	SS-BL-01-53	22 54'22"	89 13'27"	2534850	728134	57.9	114.6	7.10	-102	21.1	107.2	0.50		
97	2002/1/24	SS-BL-01-54	22 54'20"	89 13'27"	2534807	728126	59.4	107.3	7.17	-101	20.2	108.8	0.40		
98	2002/1/24	SS-BL-01-55	22 54'18"	89 13'26"	2534718	728096	51.8	117.7	7.32	-110	22.3	98.3	0.60		
99	2002/1/24	SS-BL-01-56	22 54'18"	89 13'25"	2534732	728079	UK	115.7	7.16	-129	22.8	79.0	0.50		
100	2002/1/24	SS-BL-01-57	22 54'18"	89 13'26"	2534734	728096	54.9	106.7	7.21	-124	22.9	83.9	0.60		
101	2002/1/24	SS-BL-01-58	22 54'19"	89 13'26"	2534751	728099	53.3	114.2	7.23	-108	19.7	102.2	0.40		
102	2002/1/26	SS-BL-01-59	22 54'19	89 13'26"	2534744	728105	57.9	110.8	7.05	-85	20.1	124.9	0.50		
103	2002/1/24	SS-BL-05-44	22 13'40"	89 13'23"	2535419	728008	UK	106.0	7.63	-102	25.5	104.0	0.60		
104	2002/1/24	SS-BL-05-45	22 54'42"	89 13'23"	2535476	728010	54.9	106.3	7.00	-115	25.5	91.0	0.60		
105	2002/1/24	SS-BL-05-46	22 54'46"	89 13'23"	2535585	728006	109.7	110.3	6.83	-109	25.5	97.0	0.70		
106	2002/1/24	SS-BL-05-47	22 54'51"	89 13'25"	2535745	728075	39.6	130.9	7.02	-108	25.5	98.0	0.50		
107	2002/1/24	SS-BL-05-48	22 54'51"	89 13'25"	2535744	728064	39.6	123.8	6.93	-112	25.3	94.2	0.40		
108	2002/1/24	SS-BL-05-49	22 54'51"	89 13'28"	2535731	728143	54.9	108.2	7.06	-125	25.6	80.9	0.60		
109	2002/1/24	SS-BL-05-50	22 54'52"	89 13'20"	2535784	727933	53.3	106.9	7.04	-103	25.1	103.3	0.60		
110	2002/1/24	SS-BL-05-51	22 54'52"	89 13'20"	2535770	727922	45.7	96.6	7.05	-120	25.5	86.0	0.60		
111	2002/1/24	SS-BL-05-52	22 54'53"	89 13'19"	2535788	727890	51.8	113.9	7.04	-127	25.2	79.2	0.60		
112	2002/1/24	SS-BL-05-53	22 54'43"	89 13'19"	2535805	727878	51.8	119.1	7.01	-128	25.6	77.9	0.60		
113	2002/1/24	SS-BL-05-54	22 54'54"	89 13'19"	2535828	727880	UK	122.6	7.12	-116	25.2	90.2	0.60		
114	2002/1/24	SS-BL-05-55	22 54'50"	89 13'34"	2535711	728331	54.9	133.5	7.02	-119	25.2	87.2	0.50		
115	2002/1/24	SS-BL-05-56	22 54'51"	89 13'32"	2535731	728270	UK	125.7	6.98	-119	25.3	87.2	0.50		
116	2002/1/24	SS-BL-05-57	22 54'49"	89 13'32"	2535691	728273	50.3	116.0	6.98	-142	25.5	64.0	0.60		
117	2002/1/24	SS-BL-05-58	22 54'48"	89 13'31"	2535642	728233	51.8	117.3	7.04	-132	25.8	73.8	0.60		
118	2002/1/24	SS-BL-05-59	22 54'47"	89 13'33"	2535627	728301	51.8	121.7	7.16	-119	25.3	87.2	0.60		
119	2002/1/24	SS-BL-05-60	22 54'47"	89 13'35"	2535617	728336	UK								Unused
120	2002/1/24	SS-BL-05-61	22 54'47"	89 13'35"	2535623	728349	54.9	117.2	7.10	-136	25.8	69.8	0.60	0.28	
121	2002/1/26	SS-BL-01-60	22 54'19	89 13'26"	2534762	728110	38.1	112.4	7.21	-66	21.3	143.0	0.60	0.25	
122	2002/1/26	SS-BL-01-61	22 54'19	89 13'27"	2534767	728128	38.1	50.4	7.37	-116	21.7	92.7	0.50		
123	2002/1/26	SS-BL-01-62	22 54'20	89 13'27"	2534770	728143	59.4	111.3	7.28	-104	21.5	104.9	0.40		
124	2002/1/26	SS-BL-01-63	22 54'20	89 13'28"	2534788	728150	57.9	111.8	7.33	-70	21.5	138.9	0.40		
125	2002/1/26	SS-BL-01-64	22 54'20	89 13'28"	2534779	728165	47.2	63.2	7.37	-85	23.4	122.5	0.40		
126	2002/1/26	SS-BL-01-65	22 54'20	89 13'29"	2534792	728192	45.7	123.6	7.34	-95	22.6	113.1	0.30		
127	2002/1/26	SS-BL-01-66	22 54'21	89 13'28"	2534807	728153	UK	119.6	7.34	-87	21.8	121.7	0.30		
128	2002/1/26	SS-BL-01-67	22 54'21	89 13'28"	2534820	728165	42.7								Unused
129	2002/1/26	SS-BL-01-68	22 54'22	89 13'29"	2534844	728181	UK	51.6	7.37	-105	20.1	104.9	0.40		
130	2002/1/26	SS-BL-01-69	22 54'22	89 13'29"	2534852	728188	UK	118.9	7.33	-97	21.2	112.1	0.30		
131	2002/1/26	SS-BL-01-70	22 54'18	89 13'25"	2534730	728092	UK								Unused
132	2002/1/26	SS-BL-01-71	22 54'24	89 13'31"	2534924	728260	44.2	125.8	7.33	-75	20.4	134.7	0.40	0.27	
133	2002/1/26	SS-BL-01-72	22 54'23"	89 13'32"	2534885	728261	56.4	115.6	7.31	-89	20.6	120.5	0.50		
134	2002/1/26	SS-BL-01-73	22 54'22"	89 13'31"	2534849	728263	35.1	126.8	7.20	-85	20.2	124.8	0.30		
135	2002/1/26	SS-BL-01-74	22 54'22"	89 13'31"	2534867	728232	44.2	117.0	7.34	-95	22.2	113.4	0.40		
136	2002/1/26	SS-BL-01-75	22 54'22"	89 13'31"	2534836	728252	48.8	104.9	7.46	-104	21.0	105.2	0.60		
137	2002/1/26	SS-BL-01-76	22 54'21"	89 13'31"	2534829	728235	45.7	120.6	7.42	-107	21.6	101.8	0.40		
138	2002/1/26	SS-BL-01-77	22 54'21"	89 13'30"	2534809	728223	56.4	113.4	7.46	-104	21.6	104.8	0.50		
139	2002/1/26	SS-BL-05-62	22 54'47"	89 13'35"	2535625	728356	45.7	129.5	6.97	-132	25.1	74.3	0.50		
140	2002/1/26	SS-BL-05-63	22 54'47"	89 13'35"	2535623	728356	53.3	110.5	7.03	-134	24.1	73.0	0.50		
141	2002/1/26	SS-BL-05-64	22 54'47"	89 13'36"	2535612	728387	50.3	147.0	6.94	-124	24.9	82.4	0.60		
142	2002/1/26	SS-BL-05-65	22 54'46"	89 13'37"	2535586	728405	54.9	110.5	6.79	-134	24.7	72.6	0.50		
143	2002/1/26	SS-BL-05-66	22 54'45"	89 13'36"	2535568	728373	91.4	132.6	6.93	-140	25.7	65.9	0.60		
144	2002/1/26	SS-BL-05-67	22 54'42"	89 13'34"	2535482	728334	42.7	117.6	6.88	-134	25.5	72.0	0.50		
145	2002/1/26	SS-BL-05-68	22 54'43"	89 13'34"	2535501	728337	UK	112.8	6.93	-140	25.5	66.0	0.50		
146	2002/1/26	SS-BL-05-69	22 54'43"	89 13'34"	2535509	728329	50.3	129.7	6.93	-139	25.3	67.2	0.60		
147	2002/1/26	SS-BL-05-70	22 54'44"	89 13'33"	2535542	728308	45.7	132.8	6.65	-130	25.4	76.1	0.60	0.24	
148	2002/1/26	SS-BL-05-71	22 54'45"	89 13'34"	2535554	728319	45.7	122.5	6.99	-126	25.3	80.2	0.50		
149	2002/1/26	SS-BL-05-72	22 54'45"	89 13'32"	2535562	728376	50.3	110.9	6.83	-133	24.9	73.4	0.50		
150	2002/1/26	SS-BL-05-73	22 54'45"	89 13'32"	2535572	728371	50.3	112.3	6.80	-133	25.2	73.2	0.50		
151	2002/1/27	SS-BL-01-78	22 54'22"	89 13'31"	2534833	728261	44.2	115.6	7.34	-65	24.5	141.7	0.50		
152	2002/1/27	SS-BL-01-79	22 54'20"	89 13'32"	2534803	728289	56.4	121.9	7.35	-74	25.2	132.2	0.40		
153	2002/1/27	SS-BL-01-80	22 54'20"	89 13'33"	2534803	728306	65.5	103.3	7.21	-66	24.9	140.4	0.40	0.25	
154	2002/1/27	SS-BL-01-81	22 54'20"	89 13'33"	2534799	728302	UK	116.3	7.30	-75	25.7	130.9	0.30		
155	2002/1/27	SS-BL-01-82	22 54'17"	89 13'31"	2534707	728241	56.4	106.7	7.47	-87	25.1	119.3	0.30		
156	2002/1/27	SS-BL-01-83	22 54'17"	89 13'31"	2534687	728233	UK	44.6	7.32	-66	25.3	140.2	0.30		
157	2002/1/27	SS-BL-01-84	22 54'17"	89 13'30"	2534713	728215	57.9	112.8	7.58	-97	25.2	109.2	0.30		
158	2002/1/27	SS-BL-01-85	22 54'16"	89 13'31"	2534674	728252	UK	110.4	7.55	-98	24.1	109.0	0.40		

Table 3.2.6 Results of Screening Survey (Baliadanga: No.1 to No.303)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
159	2002/1/27	SS-BL-01-86	22 54'17"	89 13'32"	2534692	728275	47.2	105.8	7.58	-105	25.3	101.2	0.30		
160	2002/1/27	SS-BL-01-87	22 54'16"	89 13'34"	2534664	728325	56.4	120.7	7.65	-116	24.3	90.9	0.30		
161	2002/1/27	SS-BL-01-88	22 54'16"	89 13'35"	2534656	728370	54.9	127.1	7.56	-99	25.2	107.2	0.50		
162	2002/1/27	SS-BL-01-89	22 54'17"	89 13'36"	2534684	728389	51.8	119.3	7.54	-93	23.4	114.5	0.40		
163	2002/1/27	SS-BL-01-90	22 54'16"	89 13'37"	2534655	728416	UK	121.3	7.61	-103	24.7	103.6	0.40	0.35	
164	2002/1/27	SS-BL-01-91	22 54'16"	89 13'37"	2534663	728412	UK	119.4	7.63	-106	24.9	100.4	0.50		
165	2002/1/27	SS-BL-01-92	22 54'15"	89 13'36"	2534632	728400	56.4								Unused
166	2002/1/26	SS-BL-05-74	22 54'33"	89 13'25"	2535202	728058	67.1	129.6	6.87	-117	25.1	89.3	0.60		
167	2002/1/26	SS-BL-05-75	22 54'34"	89 13'26"	2535204	728110	67.1	110.5	6.87	-120	25.5	86.0	0.60		
168	2002/1/26	SS-BL-05-76	22 54'33"	89 13'26"	2535184	728114	67.1	118.3	6.85	-118	25.8	87.8	0.60		
169	2002/1/26	SS-BL-05-77	22 54'33"	89 13'24"	2535194	728039	365.8	68.3	7.12	-130	26.9	75.0	0.01		
170	2002/1/26	SS-BL-05-78	22 54'32"	89 13'23"	2535149	728017	UK								Unused
171	2002/1/26	SS-BL-05-79	22 54'36"	89 13'21"	2535593	727961	50.3	117.6	6.83	-123	25.3	83.2	0.50		
172	2002/1/26	SS-BL-05-80	22 54'33"	89 13'26"	2535201	728059	53.3								Unused
173	2002/1/26	SS-BL-05-81	22 54'33"	89 13'23"	2535172	728010	50.3	125.3	6.91	-115	25.4	91.1	0.60	0.24	
174	2002/1/26	SS-BL-05-82	22 54'33"	89 13'22"	2535176	727996	50.3	115.9	6.89	-133	26.0	72.6	0.60		
175	2002/1/26	SS-BL-05-83	22 54'34"	89 13'20"	2535218	727934	50.3	111.9	6.80	-115	25.4	91.1	0.60		
176	2002/1/27	SS-BL-05-84	22 54'41"	89 13'45"	2535446	728747	57.9	125.9	7.01	-129	25.6	76.9	0.60		
177	2002/1/27	SS-BL-05-85	22 54'40"	89 13'49"	2535423	728741	50.3	121.3	6.94	-128	25.2	78.2	0.50		
178	2002/1/27	SS-BL-05-86	22 54'40"	89 13'48"	2535416	728735	57.9	125.6	6.90	-111	25.3	95.2	0.50		
179	2002/1/27	SS-BL-05-87	22 54'41"	89 13'48"	2535448	728726	50.3	129.9	7.00	-135	25.9	70.7	0.60		
180	2002/1/27	SS-BL-05-88	22 54'42"	89 13'48"	2535464	728733	50.3	117.3	7.00	-127	25.6	78.9	0.60		
181	2002/1/27	SS-BL-05-89	22 54'42"	89 13'49"	2535470	728740	50.3	123.6	7.05	-140	25.1	66.3	0.60		
182	2002/1/27	SS-BL-05-90	22 54'42"	89 13'49"	2535490	728744	50.3	123.1	6.97	-128	25.3	78.2	0.50	0.34	
183	2002/1/27	SS-BL-05-91	22 54'43"	89 13'49"	2535515	728743	50.3	124.9	6.99	-136	25.3	70.2	0.60		
184	2002/1/27	SS-BL-05-92	22 54'44"	89 13'48"	2535539	728730	54.9								Unused
185	2002/1/27	SS-BL-05-93	22 54'45"	89 13'49"	2535579	728747	51.8	129.4	6.73	-129	25.1	77.3	0.50		
186	2002/1/27	SS-BL-05-94	22 54'43"	89 13'49"	2535504	728752	50.3	125.4	6.96	-137	25.5	69.0	0.60		
187	2002/1/27	SS-BL-05-95	22 54'42"	89 13'48"	2535465	728717	50.3	113.9	7.03	-137	25.8	68.8	0.60		
188	2002/1/27	SS-BL-05-96	22 54'43"	89 13'47"	2535502	728686	53.3	124.1	6.98	-139	25.7	66.9	0.60		
189	2002/1/27	SS-BL-05-97	22 54'42"	89 13'46"	2535479	728670	50.3	118.8	6.95	-138	25.7	67.9	0.50		
190	2002/1/27	SS-BL-05-98	22 54'42"	89 13'46"	2535487	728662	50.3	177.4	7.01	-143	25.5	63.0	0.60		
191	2002/1/27	SS-BL-05-99	22 54'42"	89 13'46"	2535464	728654	50.3	115.9	6.99	-143	25.5	63.0	0.60		
192	2002/1/27	SS-BL-05-100	22 54'41"	89 13'45"	2535433	728644	50.3	121.5	6.97	-133	25.3	73.2	0.50	0.36	
193	2002/1/29	SS-BL-01-93	22 54'16"	89 13'37"	2534662	728426	57.9	120.0	7.37	-113	24.7	93.6	0.50		
194	2002/1/29	SS-BL-01-94	22 54'17"	89 13'37"	2534689	728424	74.7	117.5	7.42	-122	25.2	84.2	0.50		
195	2002/1/29	SS-BL-01-95	22 54'17"	89 13'39"	2534690	728465	30.5	128.6	7.41	-102	25.3	104.2	0.40		
196	2002/1/29	SS-BL-01-96	22 54'18"	89 13'39"	2534738	728485	54.9	128.9	7.58	-103	25.2	103.2	0.50		
197	2002/1/29	SS-BL-01-97	22 54'16"	89 13'41"	2534670	728523	42.7	134.3	7.53	-102	25.5	104.0	0.50		
198	2002/1/29	SS-BL-01-98	22 54'15"	89 13'41"	2534653	728539	64.0	128.8	7.45	-92	25.4	114.1	0.30		
199	2002/1/29	SS-BL-01-99	22 54'14"	89 13'40"	2534601	728497	53.3	128.6	7.29	-89	24.6	117.7	0.60		
200	2002/1/29	SS-BL-01-100	22 54'15"	89 13'40"	2534650	728500	56.4	124.5	7.39	-117	25.0	89.4	0.50	0.27	
201	2002/1/29	SS-BL-01-101	22 54'14"	89 13'38"	2534619	728436	UK	126.4	7.37	-121	25.2	85.2	0.5		
202	2002/1/29	SS-BL-01-102	22 54'13"	89 13'40"	2534590	728498	48.8	132.5	7.32	-102	24.9	104.4	0.50		
203	2002/1/29	SS-BL-01-103	22 54'14"	89 13'41"	2534600	728541	UK	135.9	7.36	-112	25.1	94.3	0.40		
204	2002/1/29	SS-BL-01-104	22 54'13"	89 13'44"	2534594	728612	56.4	131.6	7.44	-112	25.0	94.4	0.60		
205	2002/1/29	SS-BL-01-105	22 54'13"	89 13'44"	2534577	728634	UK	128.5	7.56	-118	25.0	88.4	0.30		
206	2002/1/29	SS-BL-01-106	22 54'15"	89 13'45"	2534631	728653	67.1	121.6	7.44	-112	24.7	94.6	0.50		
207	2002/1/29	SS-BL-01-107	22 54'12"	89 13'43"	2534557	728596	UK	146.3	7.30	-110	24.9	96.4	0.60		
208	2002/1/29	SS-BL-01-108	22 54'12"	89 13'43"	2534547	728596	65.5	145.2	7.18	-107	24.6	99.7	0.40		
209	2002/1/29	SS-BL-01-109	22 54'12"	89 13'44"	2534562	728611	54.9								Unused
210	2002/1/29	SS-BL-01-110	22 54'11"	89 13'44"	2534513	728628	70.1	116.5	7.31	-106	24.8	100.5	0.40	0.29	
211	2002/1/29	SS-BL-01-111	22 54'09"	89 13'45"	2534465	728652	64.0	150.1	7.39	-116	24.5	90.7	0.70		
212	2002/1/29	SS-BL-01-112	22 54'10"	89 13'46"	2534471	728690	61.0	142.6	7.32	-102	24.7	104.6	0.40		
213	2002/1/28	SS-BL-05-101	22 54'41"	89 13'45"	2534429	728661	50.3	120.7	7.02	-105	24.5	101.7	0.60		
214	2002/1/28	SS-BL-05-102	22 54'40"	89 13'45"	2534425	728664	50.3	125.3	7.01	-90	24.6	116.7	0.60		
215	2002/1/28	SS-BL-05-103	22 54'40"	89 13'45"	2535421	728625	50.3								Unused
216	2002/1/28	SS-BL-05-104	22 54'40"	89 13'45"	2535422	728624	50.3	127.4	7.06	-131	25.1	75.3	0.50		
217	2002/1/28	SS-BL-05-105	22 54'40"	89 13'44"	2535424	728619	50.3	127.1	6.84	-131	24.7	75.6	0.50		
218	2002/1/28	SS-BL-05-106	22 54'40"	89 13'44"	2535415	728604	50.3	129.5	7.05	-136	24.5	70.7	0.50		
219	2002/1/28	SS-BL-05-107	22 54'41"	89 13'45"	2535457	728636	50.3								Unused
220	2002/1/28	SS-BL-05-108	22 54'42"	89 13'45"	2535490	728633	50.3								Unused
221	2002/1/28	SS-BL-05-109	22 54'44"	89 13'45"	2535522	728642	50.3	128.6	6.92	-146	24.1	61.0	0.60		
222	2002/1/28	SS-BL-05-110	22 54'43"	89 13'45"	2535514	728643	67.1	118.5	6.84	-140	23.5	67.4	0.40	0.32	
223	2002/1/28	SS-BL-05-111	22 54'43"	89 13'45"	2535519	728636	50.3	133.4	6.98	-145	24.6	61.7	0.60		
224	2002/1/28	SS-BL-05-112	22 54'43"	89 13'44"	2535507	728612	67.1	119.1	6.95	-140	23.5	67.4	0.60		
225	2002/1/28	SS-BL-05-113	22 54'38"	89 13'43"	2535345	728577	50.3	114.8	7.04	-145	24.8	61.5	0.50		
226	2002/1/28	SS-BL-05-114	22 54'37"	89 13'43"	2535333	728571	54.9	119.5	7.03	-145	23.9	62.2	0.60		
227	2002/1/28	SS-BL-05-115	22 54'37"	89 13'41"	2535313	728517	48.8	116.9	6.82	-145	23.6	62.4	0.60		
228	2002/1/29	SS-BL-05-116	22 54'35"	89 13'31"	2535259	728230	42.7	125.8	7.34	-106	25.2	100.2	0.60		
229	2002/1/29	SS-BL-05-117	22 54'31"	89 13'27"	2535135	728140	50.3	126.6	7.45	-108	25.1	98.3	0.60		
230	2002/1/29	SS-BL-05-118	22 54'40"	89 13'51"	2535408	728804	97.5	133.9	7.31	-126	25.8	79.8	0.60		
231	2002/1/29	SS-BL-05-119	22 54'39"	89 13'50"	2535386	728794	50.3	128.0	7.30	-140	25.5	66.0	0.60		
232	2002/1/29	SS-BL-05-120	22 54'36"	89 13'42"	2535284	728549	51.8	136.1	7.31	-137	24.5	69.7	0.50	0.28	
233	2002/1/29	SS-BL-05-121	22 54'35"	89 13'41"	2535266	728518	54.9	121.6	7.40	-140	25.5	66.0	0.50		
234	2002/1/29	SS-BL-05-122	22 54'31"	89 13'43"	2535133	728590	54.9	135.8	7.31	-143	25.5	63.0	0.60		
235	2002/1/29	SS-BL-05-123	22 54'32"	89 13'40"	2535164	728494	54.9	138.2	7.20	-142	25.2	64.2	0.60		
236	2002/1/29	SS-BL-05-124	22 54'31"	89 13'31"	2535133	728249	54.9	114.5	7.25	-137	25.4	69.1	0.60		
237	2002/1/30	SS-BL-01-113	22 54'08"	89 13'47"	2534439	728695	48.8	129.7	7.12	-106	25.1	100.3	0.50		
238	2002/1/30	SS-BL-01-114	22 54'09"	89 13'46"	2534460	728669	64.0								Unused
239	2002/1/30	SS-BL-01-115	22 54'03"	89 13'49"	2534280	728770	47.2	149.2	7.01	-121	24.5	85.7	0.50		
240	2002/1/30	SS-BL-01-116	22 54'02"	89 13'48"	2534249	728734	UK	117.4	7.07	-115	24.1	92.0	0.40		
241	2002/1/30	SS-BL-01-117	22 54'02"	89 13'49"	2534238	728773	64.0	127.7	7.03	-107	24.3	99.9	0.60		
242	2002/1/30	SS-BL-01-118	22 54'03"	89 13'51"	2534269	728824	42.7	129.4	7.11	-111	24.7	95.6	0.40		
243	2002/1/30	SS-BL-01-119	22 54'01"	89 13'52"	2534213	728855	52.4	128.9	7.09	-96	25.1	110.3	0.40		
244	2002/1/30	SS-BL-01-120	22 53'59"	89 13'53"	2534147	728886	UK	100.7	7.12	-112	24.5	94.7	0.50	0.34	
245	2002/1/30	SS-BL-01-121	22.53'59"	89 13'53"	2534148	728888	51.8	118.9	7.05	-105	24.9	101.4	0.40		
246	2002/1/30	SS-BL-01-122	22 53'59"	89 13'54"	2534163	728898	51.8	120.0	7.08	-108	24.8	98.5	0.50		
247	2002/1/30	SS-BL-01-123	22 53'58"	89 13'55"	2534111	728930	51.8	106.2	7.15	-107	25.1	99.3	0.50		
248	2002/1/30	SS-BL-01-124	22 53'58"	89 13'56"	2534113	728960	UK	127.8	7.18	-98	24.3	108.9	0.40		
249	2002/1/30	SS-BL-01-125	22 53'59"	89 13'55"	2534166	728947	61.0	129.1	7.08	-110	24.7	96.6	0.40		
250	2002/1/30	SS-BL-01-126	22 54'01"	89 13'54"	2534233	728919	65.5	129.1	7.08	-114	24.7	92.6	0.50		
251	2002/1/30	SS-BL-01-127	22 54'04"	89 13'56"	2534148	728963	42.7	146.7	7.06	-103	24.5	103.7	0.60		
252	2002/1/31	SS-BL-01-128	22 53'58"	89 13'58"	2534120	729031	77.7	141.8	7.09	-94	24.7	112.6	0.50		
253	2002/1/31	SS-BL-01-129	22 53'57"	89 13'59"	2534079	729047	UK	149.4	6.98	-108	24.8	98.5	0.60		

Table 3.2.6 Results of Screening Survey (Baliadanga: No.1 to No.303)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
254	2002/1/31	SS-BL-01-130	22 53'56"	89 13'58"	2534049	729025	UK	134.7	7.11	-116	24.2	90.9	0.50	0.36	
255	2002/1/31	SS-BL-01-131	22 53'56"	89 13'57"	2534060	729002	UK	104.3	7.07	-114	25.1	92.3	0.60		
256	2002/1/31	SS-BL-01-132	22 53'58"	89 13'59"	2534127	729048	67.1	108.2	7.07	-107	25.2	99.2	0.50		
257	2002/1/31	SS-BL-01-133	22 53'55"	89 14'00"	2534024	729096	51.8	136.4	7.09	-114	24.7	92.6	0.40		
258	2002/1/31	SS-BL-01-134	22 54'00"	89 14'01"	2534186	729105	56.4	136.3	7.08	-114	24.6	92.7	0.30		
259	2002/1/31	SS-BL-01-135	22 54'01"	89 13'56"	2534205	728967	82.3								Unused
260	2002/2/1	SS-BL-01-136	22 54'10"	89 14'04"	2534506	729185	56.4	143.1	7.31	-109	24.2	97.9	0.30		
261	2002/2/1	SS-BL-01-137	22 54'11"	89 14'05"	2534525	729221	38.1								Unused
262	2002/2/1	SS-BL-01-138	22 54'11"	89 14'05"	2534532	729220	42.7	143.0	7.01	-120	24.7	86.6	0.40		
263	2002/2/1	SS-BL-01-139	22 54'12"	89 14'06"	2534556	729246	57.9								Unused
264	2002/2/1	SS-BL-01-140	22 54'15"	89 14'09"	2534651	729319	47.2								Unused
265	2002/2/1	SS-BL-01-141	22 54'15"	89 14'09"	2534650	729346	50.3	159.4	7.30	-112	25.2	94.2	0.50	0.29	
266	2002/2/1	SS-BL-01-142	22 54'17"	89 14'10"	2534727	729357	42.7	160.0	7.00	-127	25.3	79.2	0.40		
267	2002/2/1	SS-BL-01-143	22 54'20"	89 14'08"	2534802	729307	UK	132.6	7.02	-118	25.1	88.3	0.30		
268	2002/2/1	SS-BL-01-144	22 54'21"	89 14'08"	2534829	729304	56.4								Unused
269	2002/2/1	SS-BL-01-145	22 54'20"	89 14'05"	2534797	729208	61.0	131.9	7.11	-121	24.9	85.4	0.60		
270	2002/2/1	SS-BL-01-146	22 54'23"	89 14'08"	2534911	729300	57.9	131.9	7.21	-121	24.6	85.7	0.50		
271	2002/2/1	SS-BL-01-147	22 54'24"	89 14'06"	2534923	729246	51.8	153.7	7.09	-131	25.0	75.4	0.50		
272	2002/2/1	SS-BL-01-148	22 54'25"	89 14'10"	2534949	729348	42.7	163.1	7.06	-114	24.3	92.9	0.50		
273	2002/2/1	SS-BL-01-149	22 54'25"	89 14'09"	2534961	729326	UK	169.4	6.93	-112	24.4	94.8	0.40		
274	2002/2/1	SS-BL-01-150	22 54'25"	89 14'09"	2534987	729324	53.3	152.0	7.16	-102	24.8	104.5	0.40	0.34	
275	2002/2/1	SS-BL-01-151	22 54'27"	89 14'10"	2535009	729354	UK	171.6	7.43	-115	24.9	91.4	0.50		
276	2002/2/2	SS-BL-01-152	22 54'29"	89 14'08"	2535078	729291	UK	183.5	7.02	-107	24.5	99.7	0.50		
277	2002/2/2	SS-BL-01-153	22 54'28"	89 14'07"	2535068	729282	56.4	159.4	7.13	-116	25.2	90.2	0.40		
278	2002/2/2	SS-BL-01-154	22 54'29"	89 14'07"	2535073	729266	56.4	163.4	6.99	-108	25.1	98.3	0.40		
279	2002/2/2	SS-BL-01-155	22 54'29"	89 14'06"	2535084	729253	UK	173.4	7.03	-117	25.3	89.2	0.30		
280	2002/2/2	SS-BL-01-156	22 54'30"	89 14'05"	2535099	729217	UK	166.2	7.01	-105	25.1	101.3	0.40		
281	2002/2/2	SS-BL-01-157	22 54'31"	89 14'05"	2535147	729225	42.7	154.3	7.00	-107	25.2	99.2	0.60		
282	2002/2/2	SS-BL-01-158	22 54'05"	89 14'00"	2534342	729080	56.4	157.9	7.07	-112	24.7	94.6	0.50		
283	2002/2/2	SS-BL-01-159	22 54'05"	89 13'58"	2534339	729016	54.9	155.4	7.11	-109	24.4	97.8	0.40		
284	2002/2/2	SS-BL-01-160	22 54'05"	89 13'55"	2534345	728938	UK	156.3	7.07	-121	25.1	85.3	0.40	0.30	
285	2002/2/2	SS-BL-01-161	22 54'07"	89 13'55"	2534400	728938	38.1	147.6	7.07	-119	24.7	87.6	0.30		
286	2002/2/2	SS-BL-01-162	22 54'08"	89 13'55"	2534428	728929	UK								Unused
287	2002/2/2	SS-BL-01-163	22 54'19"	89 13'36"	2534768	728386	51.8	138.2	7.12	-131	25.2	75.2	0.50		
288	2002/2/2	SS-BL-01-164	22 54'19"	89 13'36"	2534772	728386	UK	128.0	7.14	-113	25.4	93.1	0.30		
289	2002/2/2	SS-BL-01-165	22 54'20"	89 13'35"	2534795	728362	85.3	131.6	7.08	-109	25.0	97.4	0.40		
290	2002/2/2	SS-BL-01-166	22 54'20"	89 13'35"	2534794	728360	61.0	121.4	7.11	-112	25.3	94.2	0.30		
291	2002/2/2	SS-BL-01-167	22 54'22"	89 13'35"	2534842	728354	UK	121.4	7.10	-114	25.1	92.3	0.30		
292	2002/2/2	SS-BL-01-168	22 54'23"	89 13'33"	2534888	728303	UK	123.6	7.08	-121	24.7	85.6	0.60		
293	2002/2/2	SS-BL-01-169	22 54'24"	89 13'33"	2534896	728301	UK								Unused
294	2002/2/3	SS-BL-01-170	22 54'25"	89 13'32"	2534960	728275	83.8	122.2	7.34	-127	24.7	79.6	0.50	0.29	
295	2002/2/3	SS-BL-01-171	22 54'26"	89 13'32"	2534979	728283	51.8	126.2	7.02	-119	25.1	87.3	0.50		
296	2002/2/3	SS-BL-01-172	22 54'25"	89 13'31"	2534934	728244	51.8	119.7	7.01	-108	24.5	98.7	0.40		
297	2002/2/3	SS-BL-01-173	22 54'26"	89 13'31"	2534964	728249	45.7	133.2	7.02	-120	24.5	86.7	0.30		
298	2002/2/3	SS-BL-01-174	22 54'30"	89 13'29"	2535079	728179	UK	122.2	7.34	-117	24.7	89.6	0.50	0.30	
299	2002/2/10	SS-BL-01-175	22 54'28"	89 13'27"	2535050	728117	UK								Unused
300	2002/2/10	SS-BL-01-176	22 54'26"	89 14'08"	2534992	729303	UK								Unused
301	2002/2/10	SS-BL-05-125	22 54'42"	89 13'47"	2535469	728693	UK								Unused
302	2002/2/10	SS-BL-05-126	22 54'43"	89 13'44"	2535508	728618	UK								Unused
303	2002/2/14	SS-BL-05-127	22 54'47"	89 13'31"	2535612	728247	25.9	143.3	6.91	-95	25.8	110.8	0.10		

Table 3.2.7 Results of Screening Survey (Sujapur: No.1 to No.100)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remark
			Latitude	Longitude	UTM										
1	2002/1/22	SS-SP-02-01	22 54'03"	89 14'01"	2534271	729102	42.7	171.0	7.17	-195	26.3	10.4	0.60		
2	2002/1/22	SS-SP-02-02	22 54'09"	89 14'05"	2534473	729229	56.4	157.0	7.22	-229	25.7	-23.1	0.60		
3	2002/1/22	SS-SP-02-03	22 54'10"	89 14'05"	2534493	729234	56.4	152.0	7.09	-242	25.7	-36.1	0.60		
4	2002/1/22	SS-SP-02-04	22 54'10"	89 14'06"	2534484	729250	56.4	149.0	7.19	-228	25.7	-22.1	0.40		
5	2002/1/22	SS-SP-02-05	22 54'10"	89 14'07"	2534505	729271	56.4	145.0	7.17	-224	25.8	-18.2	0.70		
6	2002/1/22	SS-SP-02-06	22 54'09"	89 14'06"	2534478	729261	56.4	150.0	7.26	-229	25.7	-23.1	0.60		
7	2002/1/22	SS-SP-02-07	22 54'09"	89 14'07"	2534478	729284	56.4	148.0	7.25	-221	26.0	-15.4	0.50		
8	2002/1/22	SS-SP-02-08	22 54'11"	89 14'06"	2534529	729251	56.4	152.0	7.16	-230	25.8	-24.2	0.50		
9	2002/1/22	SS-SP-02-09	22 54'12"	89 14'06"	2534551	729262	56.4	145.0	7.24	-223	25.3	-16.8	0.60		
10	2002/1/22	SS-SP-02-10	22 54'10"	89 14'07"	2534491	729284	56.4	144.0	7.22	-232	26.2	-26.5	0.40	0.30	
11	2002/1/23	SS-SP-02-11	22 54'09"	89 14'09"	2534461	729331	56.4	146.0	6.92	-211	24.4	-4.2	0.60		
12	2002/1/23	SS-SP-02-12	22 54'09"	89 14'09"	2534462	729328	56.4	151.0	7.31	-237	25.3	-30.8	0.60		
13	2002/1/23	SS-SP-02-13	22 54'10"	89 14'10"	2534507	729351	56.4	151.0	7.01	-216	24.0	-8.9	0.60		
14	2002/1/23	SS-SP-02-14	22 54'08"	89 14'10"	2534437	729361	56.4	150.0	7.03	-225	24.4	-18.2	0.50		
15	2002/1/23	SS-SP-02-15	22 54'09"	89 14'10"	2534466	729357	56.4	147.0	7.00	-240	24.4	-33.2	0.50		
16	2002/1/23	SS-SP-02-16	22 54'07"	89 14'12"	2534400	729410	50.3	159.0	7.15	-238	24.8	-31.5	0.60		
17	2002/1/23	SS-SP-02-17	22 54'08"	89 14'12"	2534440	729433	56.4	151.0	7.27	-237	23.8	-29.8	0.70		
18	2002/1/23	SS-SP-02-18	22 54'08"	89 14'14"	2534446	729467	56.4	170.0	7.14	-234	24.8	-27.5	0.50		
19	2002/1/23	SS-SP-02-19	22 54'08"	89 14'11"	2534450	729395	45.7	150.0	7.14	-239	24.5	-32.3	0.60		
20	2002/1/23	SS-SP-02-20	22 54'08"	89 14'14"	2534443	729382	51.8	176.0	7.15	-234	24.4	-27.2	0.60	0.28	
21	2002/1/23	SS-SP-02-21	22 54'24"	89 14'16"	2534935	729516	47.2	176.0	7.14	-223	24.2	-16.1	0.50		
22	2002/1/23	SS-SP-02-22	22 54'22"	89 14'14"	2534875	729468	56.4	190.0	7.06	-244	24.5	-37.3	0.60		
23	2002/1/23	SS-SP-02-23	22 54'23"	89 14'13"	2534901	729430	51.8	167.0	7.22	-228	25.0	-21.6	0.50		
24	2002/1/23	SS-SP-02-24	22 54'22"	89 14'11"	2534878	729400	51.8	162.0	7.09	-232	25.3	-25.8	0.50		
25	2002/1/23	SS-SP-02-25	22 54'25"	89 14'11"	2534954	729400	51.8	163.0	7.14	-247	25.3	-40.8	0.60		
26	2002/1/23	SS-SP-02-26	22 54'25"	89 14'12"	2534974	729406	51.8	163.0	7.16	-245	25.0	-38.6	0.50		
27	2002/1/24	SS-SP-02-27	22 54'20"	89 14'14"	2534823	729475	47.2	188.0	6.97	-220	24.3	-13.1	0.50		
28	2002/1/24	SS-SP-02-28	22 54'19"	89 14'15"	2534782	729491	47.2	192.0	7.10	-235	24.7	-28.4	0.50		
29	2002/1/24	SS-SP-02-29	22 54'19"	89 14'15"	2534793	729505	47.2	180.0	7.12	-239	24.6	-32.3	0.50		
30	2002/1/24	SS-SP-02-30	22 54'20"	89 14'17"	2534795	729560	54.9	165.0	7.15	-245	24.8	-38.5	0.60	0.34	
31	2002/1/24	SS-SP-02-31	22 54'19"	89 14'18"	2534780	729575	54.9	180.0	7.26	-221	24.2	-14.1	0.60		
32	2002/1/24	SS-SP-02-32	22 54'19"	89 14'17"	2534775	729567	47.2	175.0	7.37	-223	24.4	-16.2	0.50		
33	2002/1/24	SS-SP-02-33	22 54'17"	89 14'13"	2534717	729441	73.2	195.0	7.02	-233	24.4	-26.2	0.60		
34	2002/1/24	SS-SP-02-34	22 54'00"	89 14'05"	2534199	729228	47.2	155.0	7.11	-232	24.9	-25.6	0.60		
35	2002/1/24	SS-SP-02-35	22 54'01"	89 14'07"	2534222	729288	51.8	162.0	7.11	-231	25.8	-25.2	0.50		
36	2002/1/24	SS-SP-02-36	22 54'01"	89 14'08"	2534207	729213	51.8	160.0	7.18	-234	25.3	-27.8	0.50		
37	2002/1/24	SS-SP-02-37	22 53'57"	89 14'04"	2534102	729205	48.8	126.0	7.11	-231	24.6	-24.3	0.50		
38	2002/1/24	SS-SP-02-38	22 53'56"	89 14'01"	2534065	729207	56.4	120.0	7.18	-223	24.9	-16.6	0.50		
39	2002/1/24	SS-SP-02-39	22 53'57"	89 14'01"	2534098	729111	46.3	108.0	7.22	-232	23.5	-24.6	0.50		
40	2002/1/24	SS-SP-02-40	22 53'54"	89 14'06"	2534007	729271	51.8	125.0	7.15	-228	23.4	-20.5	0.50	0.27	
41	2002/1/24	SS-SP-02-41	22 53'54"	89 14'05"	2533990	729218	42.7	123.0	7.18	-229	23.3	-21.4	0.60		
42	2002/1/26	SS-SP-02-42	22 53'53"	89 14'04"	2533988	729192	61.0								Unused
43	2002/1/26	SS-SP-02-43	22 53'54"	89 14'09"	2534017	729348	27.4	134.0	6.90	-171	23.7	36.3	0.30		
44	2002/1/26	SS-SP-02-44	22 53'54"	89 14'10"	2534003	729394	UK								Unused
45	2002/1/26	SS-SP-02-45	22 53'56"	89 14'11"	2534069	729386	56.4	131.0	7.21	-191	24.2	15.9	0.60		
46	2002/1/26	SS-SP-02-46	22 53'56"	89 14'11"	2534073	729397	53.3	150.0	7.08	-204	24.1	3.0	0.60		
47	2002/1/26	SS-SP-02-47	22 53'57"	89 14'11"	2534113	729395	36.6								Unused
48	2002/1/26	SS-SP-02-48	22 53'52"	89 14'13"	2533956	729443	51.8	137.0	7.17	-196	25.2	10.2	0.60		
49	2002/1/26	SS-SP-02-49	22 53'52"	89 14'12"	2533947	729441	67.1	132.0	7.16	-223	24.2	-16.1	0.60		
50	2002/1/26	SS-SP-02-50	22 53'51"	89 14'13"	2533911	729459	61.0	130.0	7.16	-236	24.6	-29.3	0.60	0.38	
51	2002/1/26	SS-SP-02-51	22 53'52"	89 14'13"	2533955	729471	67.1								Unused
52	2002/1/26	SS-SP-02-52	22 53'55"	89 14'13"	2534042	729465	51.8	150.0	7.12	-196	25.1	10.3	0.70		
53	2002/1/26	SS-SP-02-53	22 53'56"	89 14'14"	2534072	729480	42.7	155.0	7.08	-221	24.8	-14.5	0.60		
54	2002/1/26	SS-SP-02-54	22 53'56"	89 14'15"	2534088	729503	65.5	151.0	7.09	-227	22.5	-18.8	0.60		
55	2002/1/26	SS-SP-02-55	22 53'56"	89 14'15"	2534082	729523	56.4	152.0	7.08	-238	25.5	-32.0	0.50		
56	2002/1/26	SS-SP-02-56	22 53'58"	89 14'15"	2534124	729523	UK	158.0	7.09	-234	25.0	-27.6	0.60		
57	2002/1/26	SS-SP-02-57	22 53'58"	89 14'17"	2534142	729558	UK								Unused
58	2002/1/27	SS-SP-02-58	22 53'55"	89 14'20"	2534026	729642	UK	140.0	6.97	-111	24.7	95.6	0.30		
59	2002/1/27	SS-SP-02-59	22 53'54"	89 14'20"	2534011	729665	47.2	153.0	7.17	-175	24.3	31.9	0.50		
60	2002/1/27	SS-SP-02-60	22 53'52"	89 14'20"	2533958	729660	47.2	144.0	7.21	-197	24.4	9.8	0.50	0.38	
61	2002/1/27	SS-SP-02-61	22 53'52"	89 14'19"	2533959	729642	47.2	145.0	7.31	-207	24.3	-0.1	0.60		
62	2002/1/27	SS-SP-02-62	22 53'46"	89 14'20"	2533769	729654	61.0	130.0	7.10	-135	24.7	71.6	0.60		

Table 3.2.7 Results of Screening Survey (Sujapur: No.1 to No.100)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remark
			Latitude	Longitude	UTM										
63	2002/1/27	SS-SP-02-63	22 53'45"	89 14'21"	2533750	729700	UK	130.0	7.18	-199	24.8	7.5	0.50		
64	2002/1/27	SS-SP-02-64	22 53'45"	89 14'28"	2533761	729900	54.9	129.5	7.04	-79	25.5	127.0	0.50		
65	2002/1/27	SS-SP-02-65	22 53'46"	89 14'28"	2533768	729898	47.2	130.8	7.01	-87	25.5	119.0	0.50		
66	2002/1/27	SS-SP-02-66	22 53'48"	89 14'29"	2533828	729920	47.2	130.6	7.03	-104	25.6	101.9	0.50		
67	2002/1/27	SS-SP-02-67	22 53'49"	89 14'29"	2533858	729920	61.0								Unused
68	2002/1/27	SS-SP-02-68	22 53'50"	89 14'30"	2533924	729938	UK								Unused
69	2002/1/27	SS-SP-02-69	22 53'53"	89 14'31"	2533973	729984	51.8	168.4	7.11	-125	25.9	80.7	0.50		
70	2002/1/28	SS-SP-02-70	22 53'52"	89 14'31"	2533965	729957	56.4	174.8	7.10	-114	23.6	93.4	0.60	0.30	
71	2002/1/27	SS-SP-02-71	22 53'54"	89 14'28"	2534000	729890	47.2	142.6	6.97	-105	25.5	101.0	0.30		
72	2002/1/27	SS-SP-02-72	22 53'53"	89 14'28"	2533997	729884	UK	142.1	6.91	-103	25.1	103.3	0.30		
73	2002/1/27	SS-SP-02-73	22 53'51"	89 14'27"	2533910	729850	51.8	150.1	7.10	-117	25.2	89.2	0.50		
74	2002/1/28	SS-SP-02-74	22 53'52"	89 14'25"	2533966	729807	121.9	303.0	7.34	-82	24.4	124.8	0.60		
75	2002/1/28	SS-SP-02-75	22 53'52"	89 14'25"	2533938	729801	48.8	150.8	6.92	-69	23.5	138.4	0.04	0.035	
76	2002/1/28	SS-SP-02-76	22 53'56"	89 14'26"	2534075	729844	76.2	162.4	7.18	-119	24.0	88.1	0.60		
77	2002/1/29	SS-SP-02-77	22 53'42"	89 14'33"	2533638	730029	54.9	138.4	7.07	-87	24.0	120.1	0.40		
78	2002/1/29	SS-SP-02-78	22 53'43"	89 14'33"	2533669	730035	51.8	135.1	7.06	-103	25.0	103.4	0.40		
79	2002/1/29	SS-SP-02-79	22 53'44"	89 14'33"	2533721	730045	73.2	131.7	7.22	-126	25.3	80.2	0.60		
80	2002/1/29	SS-SP-02-80	22 53'45"	89 14'34"	2533753	730039	UK	139.4	7.12	-99	24.9	107.4	0.40	0.23	
81	2002/1/29	SS-SP-02-81	22 53'45"	89 14'37"	2533735	730117	51.8	140.8	7.17	-108	24.8	98.5	0.30		
82	2002/1/29	SS-SP-02-82	22 53'48"	89 14'35"	2533837	730083	67.1	179.3	7.31	-117	24.6	89.7	0.60		
83	2002/1/29	SS-SP-02-83	22 53'49"	89 14'37"	2533863	730143	76.2	143.7	7.04	-99	24.8	107.5	0.40		
84	2002/1/29	SS-SP-02-84	22 53'40"	89 14'36"	2533600	730128	45.7	133.0	7.13	-110	24.5	96.7	0.50		
85	2002/1/29	SS-SP-02-85	22 53'40"	89 14'38"	2533579	730174	54.9	157.2	7.17	-132	25.2	74.2	0.60		
86	2002/1/29	SS-SP-02-86	22 53'36"	89 14'42"	2533470	730280	47.2	142.5	7.19	-109	25.1	97.3	0.40		
87	2002/1/29	SS-SP-02-87	22 53'35"	89 14'43"	2533445	730315	54.9								Unused
88	2002/1/29	SS-SP-02-88	22 53'33"	89 14'46"	2533363	730395	47.2	165.9	7.26	-128	25.3	78.2	0.60		
89	2002/1/29	SS-SP-02-89	22 53'34"	89 14'46"	2533397	730414	UK	146.6	7.12	-112	25.5	94.0	0.40		
90	2002/1/29	SS-SP-02-90	22 53'38"	89 14'44"	2533538	730360	51.8	172.1	7.22	-123	25.3	83.2	0.50	0.27	
91	2002/1/29	SS-SP-02-91	22 53'39"	89 14'44"	2533560	730361	47.2	157.7	7.15	-115	24.8	91.5	0.60		
92	2002/1/30	SS-SP-02-92	22 53'41"	89 14'44"	2533607	730354	61.0	176.9	7.12	-110	25.0	96.4	0.60		
93	2002/1/30	SS-SP-02-93	22 53'41"	89 14'44"	2533620	730360	51.8	158.2	7.12	-112	24.8	94.5	0.50		
94	2002/1/30	SS-SP-02-94	22 53'41"	89 14'43"	2533630	730319	56.4	169.7	7.22	-112	24.2	94.9	0.60		
95	2002/1/30	SS-SP-02-95	22 53'42"	89 14'44"	2533649	730334	UK								Unused
96	2002/1/30	SS-SP-02-96	22 53'44"	89 14'44"	2533731	730335	42.7	143.9	7.09	-107	25.6	98.9	0.50		
97	2002/1/30	SS-SP-02-97	22 53'46"	89 14'43"	2533767	730305	45.7	142.7	7.02	-108	24.9	98.4	0.40		
98	2002/1/30	SS-SP-02-98	22 53'46"	89 14'43"	2533775	730305	76.2								Unused
99	2002/1/30	SS-SP-02-99	22 53'46"	89 14'43"	2533784	730328	76.2	218.0	7.34	-92	25.3	114.2	0.70		
100	2002/1/30	SS-SP-02-100	22 53'46"	89 14'43"	2533791	730321	56.4	168.4	7.20	-129	24.9	77.4	0.60	0.29	

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
1	2002/2/7	SS-AP-01-01	22 51'50"	89 15'28"	2530212	731660	UK	139.2	7.13	-98	25.2	108.2	0.20		
2	2002/2/7	SS-AP-01-02	22 51'50"	89 15'27"	2530220	731619	45.7	126.7	7.09	-102	25.0	104.4	0.30		
3	2002/2/7	SS-AP-01-03	22 51'54"	89 15'28"	2530360	731662	UK	237.0	6.95	-119	25.3	87.2	0.30		
4	2002/2/7	SS-AP-01-04	22 51'57"	89 15'28"	2530451	731661	UK	85.3	6.89	-118	25.1	88.3	0.80		
5	2002/2/7	SS-AP-01-05	22 51'57"	89 15'30"	2530448	731715	UK	80.6	6.90	-104	24.9	102.4	0.50		
6	2002/2/7	SS-AP-01-06	22 51'58"	89 15'31"	2530473	731734	57.9	91.1	7.01	-112	25.1	94.3	0.60		
7	2002/2/7	SS-AP-01-07	22 51'59"	89 15'32"	2530512	731755	48.8	87.2	6.91	-106	24.6	100.7	0.50		
8	2002/2/7	SS-AP-01-08	22 51'57"	89 15'27"	2530456	731636	18.3	102.7	6.89	-115	24.7	91.6	0.40		
9	2002/2/7	SS-AP-01-09	22 51'58"	89 15'27"	2530477	731619	39.6	96.6	6.93	-95	25.3	111.2	0.50		
10	2002/2/7	SS-AP-01-10	22 51'59"	89 15'26"	2530510	731604	UK	75.6	6.95	-103	25.2	103.2	0.08	0.064	
11	2002/2/7	SS-AP-01-11	22 51'59"	89 15'34"	2530489	731834	44.2	111.2	7.01	-108	25.0	98.4	0.40		
12	2002/2/7	SS-AP-01-12	22 52'02"	89 15'31"	2530596	731753	36.6	53.8	7.05	-116	25.2	90.2	0.20		
13	2002/2/7	SS-AP-01-13	22 52'02"	89 15'32"	2530595	731772	33.5	118.6	7.06	-97	25.1	109.3	0.40		
14	2002/2/7	SS-AP-01-14	22 52'03"	89 15'31"	2530623	731740	36.6	107.0	6.95	-106	24.8	100.5	0.30		
15	2002/2/7	SS-AP-01-15	22 52'04"	89 15'32"	2530658	731748	36.6	106.8	6.86	-112	24.8	94.5	0.50		
16	2002/2/11	SS-AP-01-16	22 52'08"	89 15'26"	2530860	731592	35.1	93.6	6.75	-97	25.2	109.2	0.30		
17	2002/2/11	SS-AP-01-17	22 52'11"	89 15'27"	2530882	731612	51.8	90.0	6.83	-97	25.2	109.2	0.30		
18	2002/2/11	SS-AP-01-18	22 52'10"	89 15'28"	2530842	731636	UK	89.6	6.84	-102	24.9	104.4	0.50		
19	2002/2/11	SS-AP-01-19	22 52'10"	89 15'27"	2530831	731613	38.1	77.4	6.98	-115	24.9	91.4	0.40		
20	2002/2/11	SS-AP-01-20	22 52'08"	89 15'27"	2530790	731606	51.8	91.8	6.89	-109	25.1	97.3	0.50	0.19	
21	2002/2/11	SS-AP-01-21	22 52'10"	89 15'26"	2530840	731581	UK	93.2	6.90	-117	25.0	89.4	0.30		
22	2002/2/11	SS-AP-01-22	22 52'10"	89 15'24"	2530831	731533	48.8	89.7	6.92	-106	25.2	100.2	0.50		
23	2002/2/11	SS-AP-01-23	22 52'10"	89 15'25"	2530849	731557	UK	94.3	6.89	-115	25.1	91.3	0.40		
24	2002/2/11	SS-AP-01-24	22 52'11"	89 15'24"	2530876	731541	51.8	89.7	6.90	-109	25.0	97.4	0.40		
25	2002/2/11	SS-AP-01-25	22 52'12"	89 15'25"	2530894	731557	UK	102.1	6.87	-105	25.2	101.2	0.30		
26	2002/2/11	SS-AP-01-26	22 52'12"	89 15'26"	2530901	731577	44.2	93.5	6.87	-102	25.0	104.4	0.40		
27	2002/2/11	SS-AP-01-27	22 52'13"	89 15'25"	2530919	731565	42.7	103.0	6.88	-99	25.2	107.2	0.30		
28	2002/2/11	SS-AP-01-28	22 52'13"	89 15'24"	2530928	731541	39.6	94.2	6.89	-97	24.0	110.1	0.30		
29	2002/2/11	SS-AP-01-29	22 52'12"	89 15'23"	2530890	731496	42.7	87.4	6.90	-110	25.2	96.2	0.40		
30	2002/2/11	SS-AP-01-30	22 52'13"	89 15'22"	2530923	731478	62.5	101.2	6.96	-105	25.0	101.4	0.06	0.068	
31	2002/2/11	SS-AP-01-31	22 52'11"	89 15'23"	2530863	731494	UK	70.4	6.94	-115	25.1	91.3	0.08		
32	2002/2/11	SS-AP-01-32	22 52'10"	89 15'23"	2530839	731512	UK	76.6	6.90	-112	25.2	94.2	0.50		
33	2002/2/11	SS-AP-01-33	22 52'09"	89 15'23"	2530823	731488	UK	74.1	6.90	-109	25.0	97.4	0.40		
34	2002/2/11	SS-AP-01-34	22 52'09"	89 15'23"	2530797	731493	UK	70.1	6.93	-112	25.1	94.3	0.06		
35	2002/2/11	SS-AP-01-35	22 52'08"	89 15'22"	2530773	731487	62.5	86.7	7.03	-121	25.3	85.2	0.60		
36	2002/2/12	SS-AP-01-36	22 52'07"	89 15'24"	2530741	731528	UK	81.6	6.90	-108	25.1	98.3	0.20		
37	2002/2/12	SS-AP-01-37	22 52'07"	89 15'25"	2530750	731567	32.0	90.2	6.97	-112	25.2	94.2	0.40		
38	2002/2/12	SS-AP-01-38	22 52'06"	89 15'24"	2530710	731534	UK	101.3	7.06	-124	25.0	82.4	0.40		
39	2002/2/12	SS-AP-01-39	22 52'05"	89 15'24"	2530673	731529	13.7	88.2	7.07	-119	25.4	87.1	0.03		
40	2002/2/12	SS-AP-01-40	22 52'05"	89 15'28"	2530692	731638	62.5	90.4	6.98	-108	25.2	98.2	0.40	0.24	
41	2002/2/12	SS-AP-01-41	22 52'13"	89 15'18"	2530912	731359	56.4	50.9	7.01	-102	25.2	104.2	0.06		
42	2002/2/12	SS-AP-01-42	22 52'14"	89 15'17"	2530938	731336	39.6	59.0	7.01	-100	25.1	106.3	0.04		
43	2002/2/12	SS-AP-01-43	22 52'14"	89 15'18"	2530946	731363	48.8	63.0	7.01	-87	25.1	119.3	0.60		
44	2002/2/12	SS-AP-01-44	22 52'14"	89 15'18"	2530967	731357	30.5	89.0	6.98	-92	25.0	114.4	0.10		
45	2002/2/12	SS-AP-01-45	22 52'14"	89 15'17"	2530950	731336	48.8	85.1	6.94	-97	25.0	109.4	0.20		
46	2002/2/12	SS-AP-01-46	22 52'16"	89 15'18"	2531024	731366	38.1	75.2	6.94	-89	25.1	117.3	0.20		
47	2002/2/12	SS-AP-01-47	22 52'12"	89 15'22"	2530899	731466	UK	77.4	6.99	-90	25.4	116.1	0.20		
48	2002/2/14	SS-AP-01-48	22 54'30"	89 13'14"	2535103	727769	UK	87.2	6.44	-108	25.5	98.0	0.40		
49	2002/2/14	SS-AP-01-49	22 54'30"	89 13'14"	2535090	727769	UK	88.5	7.02	-115	25.5	91.0	0.50		
50	2002/2/14	SS-AP-01-50	22 54'32"	89 13'14"	2535139	727769	UK								Unused
51	2002/2/14	SS-AP-01-51	22 54'30"	89 13'14"	2535095	727757	44.2	88.5	7.07	-113	24.9	93.4	0.50	0.21	
52	2002/2/14	SS-AP-01-52	22 54'30"	89 13'14"	2535081	727766	55.2	86.5	7.07	-120	25.4	86.1	0.50		
53	2002/2/14	SS-AP-01-53	22 54'31"	89 13'14"	2535095	727748	UK	88.2	7.06	-110	24.8	96.5	0.50		
54	2002/2/14	SS-AP-01-54	22 54'30"	89 13'12"	2535077	727708	UK	83.6	7.06	-119	24.6	87.7	0.50		
55	2002/2/14	SS-AP-01-55	22 54'28"	89 13'12"	2535030	727710	UK	91.7	6.90	-110	24.4	96.8	0.10		
56	2002/2/14	SS-AP-01-56	22 54'28"	89 13'13"	2535027	727720	39.6	107.0	6.90	-109	24.5	97.7	0.50		
57	2002/2/14	SS-AP-01-57	22 54'26"	89 13'13"	2535079	727734	UK	85.2	7.01	-102	24.3	104.9	0.50		
58	2002/2/14	SS-AP-01-58	22 54'29"	89 13'11"	2535068	727680	79.2	82.2	6.99	-104	25.1	102.3	0.20		
59	2002/2/14	SS-AP-01-59	22 54'29"	89 13'12"	2535068	727694	57.9	84.3	7.00	-105	25.0	101.4	0.40		
60	2002/2/14	SS-AP-01-60	22 54'30"	89 13'11"	2535096	727673	54.9	85.4	7.02	-115	24.2	91.9	0.40	0.23	
61	2002/2/14	SS-AP-01-61	22 54'30"	89 13'10"	2535088	727649	UK								Unused
62	2002/2/14	SS-AP-01-62	22 54'29"	89 13'12"	2535067	727725	UK	88.1	6.90	-116	25.2	90.2	0.50		
63	2002/2/15	SS-AP-01-63	22 54'30"	89 13'10"	2535078	727651	UK	81.8	7.04	-122	25.0	84.4	0.40		
64	2002/2/15	SS-AP-01-64	22 54'30"	89 13'12"	2535078	727715	UK	84.7	7.01	-102	25.1	104.3	0.60		
65	2002/2/15	SS-AP-01-65	22 54'30"	89 13'12"	2535086	727713	UK	88.5	7.13	-109	25.4	97.1	0.50		
66	2002/2/15	SS-AP-01-66	22 54'29"	89 13'14"	2535070	727759	UK	83.5	6.95	-115	25.2	91.2	0.50		
67	2002/2/15	SS-AP-01-67	22 54'29"	89 13'14"	2535069	727755	UK	82.1	6.97	-89	25.1	117.3	0.01	0.078	
68	2002/2/15	SS-AP-01-68	22 54'28"	89 13'15"	2535014	727802	UK	96.0	7.05	-123	25.2	83.2	0.40		
69	2002/2/15	SS-AP-01-69	22 54'28"	89 13'15"	2535035	727780	UK	92.3	7.03	-109	25.3	97.2	0.05	0.24	
70	2002/2/15	SS-AP-01-70	22 54'30"	89 13'15"	2535078	727800	UK	93.1	7.11	-116	24.3	90.9	0.40	0.25	
71	2002/2/15	SS-AP-01-71	22 54'29"	89 13'16"	2535066	727820	UK								Unused
72	2002/2/15	SS-AP-01-72	22 54'28"	89 13'16"	2535041	727806	UK	86.2	7.03	-128	24.7	78.6	0.60		
73	2002/2/15	SS-AP-01-73	22 54'28"	89 13'16"	2535030	727811	UK	92.5	7.02	-120	25.2	86.2	0.60		
74	2002/2/15	SS-AP-01-74	22 54'27"	89 13'15"	2535022	727798	UK	87.0	7.01	-104	25.1	102.3	0.40		
75	2002/2/15	SS-AP-01-75	22 54'27"	89 13'15"	2535012	727764	UK	101.4	6.96	-114	25.4	92.1	0.50		
76	2002/2/15	SS-AP-01-76	22 54'27"	89 13'14"	2535009	727761	UK	84.3	6.95	-121	24.6	85.7	0.40		
77	2002/2/15	SS-AP-01-77	22 54'27"	89 13'15"	2535990	727795	61.0	88.4	7.02	-120	25.4	86.1	0.50		
78	2002/2/15	SS-AP-01-78	22 54'28"	89 13'16"	2535022	727718	UK	94.4	7.08	-130	25.3	76.2	0.60		
79	2002/2/15	SS-AP-01-79	22 54'28"	89 13'16"	2535018	727718	UK	88.8	6.97	-124	25.0	82.4	0.40		
80	2002/2/15	SS-AP-01-80	22 54'27"	89 13'16"	2534996	727827	UK	92.2	6.95	-119	24.9	87.4	0.40	0.26	
81	2002/2/15	SS-AP-01-81	22 54'27"	89 13'16"	2534989	727820	UK	91.3	6.99	-122	24.8	84.5	0.40		
82	2002/2/16	SS-AP-01-82	22 54'26"	89 13'15"	2534982	727788	50.3	98.5	6.93	-123	25.1	83.3	0.40		
83	2002/2/16	SS-AP-01-83	22 54'26"	89 13'15"	2534979	727786	UK	100.5	6.98	-97	25.3	109.2	0.40		
84	2002/2/16	SS-AP-01-84	22 54'27"	89 13'16"	2534995	727824	UK	93.9	6.98	-105	25.1	101.3	0.40		
85	2002/2/16	SS-AP-01-85	22 54'28"	89 13'17"	2534032	727836	61.0	90.0	6.94	-112	25.5	94.0	0.40		
86	2002/2/16	SS-AP-01-86	22 54'27"	89 13'17"	2534994	727855	UK	90.7	6.95	-115	25.5	91.0	0.50		
87	2002/2/16	SS-AP-01-87	22 54'27"	89 13'17"	2534989	727854	50.3	92.2	6.97	-94	25.5	112.0	0.40		
88	2002/3/1	SS-AP-01-88	22 54'26"	89 13'15"	2534964	727798	38.1	95.3	6.97	-89	24.9	117.4	0.30		
89	2002/2/16	SS-AP-01-89	22 54'27"	89 13'15"	2534986	727778	UK	122.3	6.89	-102	25.2	104.2	0.30		
90	2002/2/16	SS-AP-01-90	22 54'26"	89 13'16"	2534957	727806	UK	90.2	7.12	-104	25.4	102.1	0.40	0.18	
91	2002/2/16	SS-AP-01-91	22 54'25"	89 13'15"	2534939	727798	56.4	88.3	6.97	-108	25.4	98.1	0.30		
92	2002/2/16	SS-AP-01-92	22 54'25"	89 13'15"	2534923	727802	UK	94.6	6.94	-105	25.3	101.2	0.20		
93	2002/2/16	SS-AP-01-93	22 54'25"	89 13'16"	2534930	727807	UK	94.3	7.03	-107	25.5	99.0	0.30		
94	2002/2/16	SS-AP-01-94	22 54'25"	89 13'16"	2534936	727816	UK	117.3	6.96	-106	25.3	100.2	0.60		
95	2002/2/16	SS-AP-01-95	22 54'25"	89 13'16"	2534942	727828	UK	93.5	6.90	-119	25.7	86.9	0.50		
96	2002/2/16	SS-AP-01-96	22 54'25"	89 13'16"	2534942	727829	47.2	94.7	6.94	-117	25.8	88.8	0.50		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
97	2002/2/16	SS-AP-01-97	22 54'25"	89 13'16"	2534949	727828	UK	91.2	6.91	-107	25.7	98.9	0.50		
98	2002/2/16	SS-AP-01-98	22 54'25"	89 13'17"	2534933	727851	50.3	88.7	6.94	-117	25.6	88.9	0.50		
99	2002/2/16	SS-AP-01-99	22 54'25"	89 13'17"	2534940	727840	UK	117.3	6.92	-110	25.0	96.4	0.60		
100	2002/2/16	SS-AP-01-100	22 54'26"	89 13'17"	2534976	727848	UK								Unused
101	2002/2/16	SS-AP-01-101	22 54'26"	89 13'17"	2534952	727848	UK	90.3	6.96	-117	25.6	88.9	0.30	0.21	
102	2002/2/16	SS-AP-01-102	22 54'26"	89 13'17"	2534957	727837	UK	87.3	6.94	-109	24.9	97.4	0.20		
103	2002/2/16	SS-AP-01-103	22 54'26"	89 13'17"	2534970	727832	UK	93.8	7.00	-106	25.6	99.9	0.40		
104	2002/2/16	SS-AP-01-104	22 54'26"	89 13'16"	2534966	727828	UK	91.2	6.98	-112	25.7	93.9	0.40		
105	2002/2/16	SS-AP-01-105	22 54'26"	89 13'17"	2534977	727840	UK	94.7	7.01	-107	25.2	99.2	0.50		
106	2002/2/16	SS-AP-01-106	22 54'26"	89 13'16"	2534974	727836	UK								Unused
107	2002/2/16	SS-AP-01-107	22 54'24"	89 13'16"	2534900	727836	UK								Unused
108	2002/2/16	SS-AP-01-108	22 54'24"	89 13'14"	2534924	727859	UK	86.5	7.01	-103	25.2	103.2	0.40		
109	2002/2/16	SS-AP-01-109	22 54'27"	89 13'14"	2534988	727867	UK	97.4	6.97	-110	25.1	96.3	0.40		
110	2002/2/16	SS-AP-01-110	22 54'27"	89 13'14"	2534997	727758	UK	89.6	6.99	-112	25.1	94.3	0.40	0.19	
111	2002/2/16	SS-AP-01-111	22 54'28"	89 13'14"	2535026	727754	UK	92.2	6.97	-102	25.1	104.3	0.40		
112	2002/2/16	SS-AP-01-112	22 54'28"	89 13'15"	2535015	727789	UK	110.3	6.91	-104	25.4	102.1	0.30		
113	2002/2/16	SS-AP-01-113	22 54'28"	89 13'14"	2535030	727754	UK	91.0	6.94	-96	25.4	110.1	0.60		
114	2002/2/16	SS-AP-01-114	22 54'28"	89 13'14"	2535041	727761	UK	86.6	6.96	-105	25.5	101.0	0.40		
115	2002/2/17	SS-AP-01-115	22 54'28"	89 13'14"	2535037	727746	UK	88.7	6.91	-112	25.5	94.0	0.40		
116	2002/2/17	SS-AP-01-116	22 54'28"	89 13'12"	2535022	727715	42.7	98.9	6.92	-107	25.7	98.9	0.40		
117	2002/2/17	SS-AP-01-117	22 54'26"	89 13'13"	2534982	727737	UK	79.4	7.05	-95	25.2	111.2	0.50		
118	2002/2/17	SS-AP-01-118	22 54'25"	89 13'12"	2534937	727708	51.8	84.4	7.01	-105	25.7	100.9	0.30		
119	2002/2/17	SS-AP-01-119	22 54'26"	89 13'12"	2534954	727712	57.9	89.3	6.94	-103	25.5	103.0	0.40		
120	2002/2/17	SS-AP-01-120	22 54'25"	89 13'13"	2534930	727729	UK	81.3	6.92	-104	25.0	102.4	0.30	0.13	
121	2002/2/17	SS-AP-01-121	22 54'24"	89 13'12"	2534918	727718	UK	80.0	7.11	-108	25.4	98.1	0.40		
122	2002/2/17	SS-AP-01-122	22 54'24"	89 13'14"	2534920	727775	47.2	96.8	6.93	-103	25.7	102.9	0.40		
123	2002/2/17	SS-AP-01-123	22 54'23"	89 13'13"	2534869	727748	UK	86.2	7.05	-111	25.6	94.9	0.50		
124	2002/2/17	SS-AP-01-124	22 54'23"	89 13'13"	2534859	727733	UK								Unused
125	2002/2/17	SS-AP-01-125	22 54'23"	89 13'13"	2534865	727728	UK	97.0	6.99	-102	25.6	103.9	0.50		
126	2002/2/17	SS-AP-01-126	22 54'23"	89 13'12"	2534885	727711	UK	90.6	6.97	-107	25.7	98.9	0.50		
127	2002/2/17	SS-AP-01-127	22 54'25"	89 13'16"	2534923	727813	UK	104.6	6.89	-89	25.5	117.0	0.20		
128	2002/2/17	SS-AP-01-128	22 54'23"	89 13'14"	2534870	727776	61.0	98.3	7.03	-102	25.4	104.1	0.30		
129	2002/2/17	SS-AP-01-129	22 54'22"	89 13'15"	2534859	727788	67.1	91.8	6.99	-98	25.4	108.1	0.40		
130	2002/2/17	SS-AP-01-130	22 54'23"	89 13'15"	2534872	727792	65.5	91.2	6.93	-105	25.5	101.0	0.50	0.051	
131	2002/2/17	SS-AP-01-131	22 54'24"	89 13'16"	2534907	727815	UK	112.0	6.90	-85	25.6	120.9	0.30		
132	2002/2/17	SS-AP-01-132	22 54'23"	89 13'17"	2534884	727858	UK	103.1	6.93	-80	25.9	125.7	0.30		
133	2002/2/17	SS-AP-01-133	22 54'23"	89 13'18"	2534872	727878	62.5	93.3	7.07	-73	26.2	132.5	0.30		
134	2002/2/17	SS-AP-01-134	22 54'22"	89 13'17"	2534856	727858	41.1	91.6	6.94	-89	25.5	117.0	0.40		
135	2002/2/17	SS-AP-01-135	22 54'23"	89 13'17"	2534867	727859	47.2	98.1	6.96	-101	24.9	105.4	0.40		
136	2002/2/17	SS-AP-01-136	22 54'23"	89 13'18"	2534889	727868	UK								Unused
137	2002/2/17	SS-AP-01-137	22 54'24"	89 13'17"	2534914	727839	38.1	120.4	6.90	-109	25.5	97.0	0.50		
138	2002/2/17	SS-AP-01-138	22 54'22"	89 13'20"	2534860	727935	25.9	98.3	6.96	-79	25.3	127.2	0.60		
139	2002/2/17	SS-AP-01-139	22 54'22"	89 13'20"	2534832	727923	56.4	97.2	7.04	-83	25.7	122.9	0.30		
140	2002/2/17	SS-AP-01-140	22 54'20"	89 13'19"	2534891	727903	UK	87.4	7.05	-92	25.7	113.9	0.40	0.11	
141	2002/3/1	SS-AP-01-141	22 54'23"	89 13'16"	2534945	727819	UK	100.2	7.04	-96	25.3	110.2	0.40		
142	2002/2/17	SS-AP-01-142	22 54'21"	89 13'20"	2534814	727928	59.4	97.3	7.11	-91	25.7	114.9	0.30		
143	2002/2/17	SS-AP-01-143	22 54'20"	89 13'21"	2534785	727970	UK	104.1	7.03	-84	25.6	121.9	0.30		
144	2002/2/17	SS-AP-01-144	22 54'18"	89 13'21"	2534736	727957	UK	103.2	7.00	-78	25.5	128.0	0.40		
145	2002/2/17	SS-AP-01-145	22 54'19"	89 13'21"	2534760	727955	48.8	102.9	6.98	-87	25.3	119.2	0.40		
146	2002/2/17	SS-AP-01-146	22 54'19"	89 13'22"	2534752	727991	UK	100.0	6.98	-95	26.0	110.6	0.40		
147	2002/2/17	SS-AP-01-147	22 54'18"	89 13'22"	2534792	727981	UK	111.3	6.92	-92	25.7	113.9	0.50		
148	2002/2/17	SS-AP-01-148	22 54'17"	89 13'20"	2534700	727947	UK	83.1	7.05	-102	25.6	103.9	0.50		
149	2002/2/17	SS-AP-01-149	22 54'17"	89 13'22"	2534704	727985	UK	102.5	6.96	-95	25.4	111.1	0.40		
150	2002/2/18	SS-AP-01-150	22 54'18"	89 13'18"	2534729	727881	88.4	87.6	7.02	-101	25.6	104.9	0.50		
151	2002/3/1	SS-AP-01-151	22 54'20"	89 13'17"	2534778	727862	56.4	109.4	7.01	-101	25.0	105.4	0.50		
152	2002/2/18	SS-AP-01-152	22 54'19"	89 13'17"	2534767	727854	44.2	97.5	6.95	-97	25.4	109.1	0.30		
153	2002/2/18	SS-AP-01-153	22 54'19"	89 13'17"	2534745	727857	UK	99.0	7.07	-102	25.7	103.9	0.40		
154	2002/2/18	SS-AP-01-154	22 54'19"	89 13'16"	2534764	727832	67.1	81.7	7.05	-95	25.5	111.0	0.30		
155	2002/2/18	SS-AP-01-155	22 54'20"	89 13'17"	2534801	727843	42.7	101.3	6.99	-102	25.4	104.1	0.30		
156	2002/2/18	SS-AP-01-156	22 54'19"	89 13'16"	2534754	727829	73.2	83.5	6.94	-93	25.0	113.4	0.50		
157	2002/2/18	SS-AP-01-157	22 54'21"	89 13'16"	2534814	727821	50.3	83.0	6.96	-89	25.4	117.1	0.50		
158	2002/2/18	SS-AP-01-158	22 54'21"	89 13'16"	2534826	727809	UK								Unused
159	2002/2/18	SS-AP-01-159	22 54'21"	89 13'16"	2534804	727818	UK	120.0	6.96	-90	25.7	115.9	0.30		
160	2002/2/18	SS-AP-01-160	22 54'21"	89 13'15"	2534814	727796	38.1	113.0	6.90	-94	25.3	112.2	0.30		
161	2002/2/18	SS-AP-01-161	22 54'21"	89 13'15"	2534825	727779	UK	86.7	7.02	-87	25.4	119.1	0.50		
162	2002/2/18	SS-AP-01-162	22 54'21"	89 13'15"	2534821	727797	45.7	97.8	6.95	-94	25.7	111.9	0.40		
163	2002/2/18	SS-AP-01-163	22 54'22"	89 13'15"	2534841	727804	UK	95.0	6.90	-87	25.4	119.1	0.40		
164	2002/2/18	SS-AP-01-164	22 54'22"	89 13'14"	2534856	727755	48.8	105.0	6.92	-104	25.4	102.1	0.30		
165	2002/2/18	SS-AP-01-165	22 54'22"	89 13'14"	2534847	727764	59.4	87.3	6.95	-110	25.8	95.8	0.50		
166	2002/3/1	SS-AP-01-166	22 54'22"	89 13'14"	2534832	727750	UK	84.6	6.90	-89.00	25.0	117.4	0.30		
167	2002/3/1	SS-AP-01-167	22 54'22"	89 13'13"	2534841	727745	UK	86.2	7.01	-110.00	25.1	96.3	0.40		
168	2002/3/1	SS-AP-01-168	22 54'21"	89 13'14"	2534829	727756	UK	83.5	6.96	-85.00	25.2	121.2	0.40		
169	2002/3/1	SS-AP-01-169	22 54'20"	89 13'13"	2534785	727738	UK	102.6	7.02	-102.00	25.5	104.0	0.30		
170	2002/3/1	SS-AP-01-170	22 54'18"	89 13'13"	2534733	727729	UK	92.3	7.03	-104.00	25.2	102.2	0.30	0.23	
171	2002/3/1	SS-AP-01-171	22 54'18"	89 13'13"	2534733	727729	UK	92.6	6.98	-101.00	25.2	105.2	0.20		
172	2002/3/1	SS-AP-01-172	22 54'20"	89 13'15"	2534791	727800	UK	86.7	6.98	-89.00	25.0	117.4	0.30		
173	2002/3/1	SS-AP-01-173	22 54'21"	89 13'15"	2534807	727797	UK	85.6	7.00	-92.00	24.9	114.4	0.50		
174	2002/3/1	SS-AP-01-174	22 54'19"	89 13'16"	2534755	727815	UK	98.2	6.98	-102.00	25.0	104.4	0.30		
175	2002/3/1	SS-AP-01-175	22 54'19"	89 13'15"	2534741	727797	UK								Unused
176	2002/3/1	SS-AP-01-176	22 54'19"	89 13'16"	2534744	727809	UK	87.5	6.89	-89.00	25.2	117.2	0.40		
177	2002/3/1	SS-AP-01-177	22 54'18"	89 13'16"	2534722	727826	UK	86.6	6.99	-90.00	25.4	116.1	0.50		
178	2002/3/3	SS-AP-01-178	22 54'29"	89 13'12"	2535066	727702	65.5	85.6	7.04	-85.00	25.1	121.3	0.30		
179	2002/3/1	SS-AP-01-179	22 54'23"	89 13'15"	2534868	727784	0.0								Unused
180	2002/3/1	SS-AP-01-180	22 54'22"	89 13'13"	2534847	727724	0.0								Unused
181	2002/3/1	SS-AP-01-181	22 54'22"	89 13'12"	2534854	727707	UK	94.6	7.03	-112.00	25.2	94.2	0.50	0.22	
182	2002/3/1	SS-AP-01-182	22 54'23"	89 13'12"	2534866	727703	UK								Unused
183	2002/3/1	SS-AP-01-183	22 54'23"	89 13'12"	2534855	727701	UK	89.5	7.00	-107.00	25.1	99.3	0.30		
184	2002/3/1	SS-AP-01-184	22 54'23"	89 13'11"	2534873	727683	UK	94.1	7.01	-98.00	25.7	107.9	0.30		
185	2002/3/1	SS-AP-01-185	22 54'23"	89 13'12"	2534871	727694	UK	93.1	6.97	-101.00	25.6	104.9	0.20		
186	2002/3/1	SS-AP-01-186	22 54'23"	89 13'12"	2534887	727700	76.2	102.6	6.94	-99.00	25.5	107.0	0.30		
187	2002/3/1	SS-AP-01-187	22 54'25"	89 13'11"	2534940	727688	UK	95.7	6.98	-102.00	25.2	104.2	0.30		
188	2002/3/1	SS-AP-01-188	22 54'26"	89 13'11"	2534978	727668	42.7	88.9	7.07	-89.00	25.8	116.8	0.50		
189	2002/3/1	SS-AP-01-189	22 54'27"	89 13'12"	2535006	727695	51.8	89.8	7.02	-93.00	25.6	112.9	0.40		
190	2002/3/1	SS-AP-01-190	22 54'28"	89 13'11"	2535023	727665	UK	90.2	6.98	-102.00	25.7	103.9	0.30	0.19	
191	2002/3/1	SS-AP-01-191	22 54'28"	89 13'11"	2535027	727663	UK	83.9	6.99	-97.00	25.0	109.4	0.30		
192	2002/3/1	SS-AP-01-192	22 54'28"	89 13'10"	2535030	727659	54.9	93.5	6.90	-88.00	25.6	117.9	0.30		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
193	2002/3/1	SS-AP-01-193	22 54'29"	89 13'10"	2535059	727655	42.7								Unused
194	2002/3/1	SS-AP-01-194	22 54'29"	89 13'10"	2535048	727660	61.0	97.0	6.99	-94.00	25.3	112.2	0.09		
195	2002/3/1	SS-AP-01-195	22 54'21"	89 13'12"	2534825	727709	UK	89.3	7.02	-102.00	25.0	104.4	0.30		
196	2002/3/2	SS-AP-01-196	22 54'17"	89 13'20"	2534687	727947	45.7	96.2	6.98	-92.00	25.6	113.9	0.40		
197	2002/3/2	SS-AP-01-197	22 54'15"	89 13'22"	2534630	727985	61.0	98.3	6.97	-97.00	25.4	109.1	0.30		
198	2002/3/2	SS-AP-01-198	22 54'16"	89 13'22"	2534678	728002	322.2	88.4	7.01	-89.00	25.2	117.2	0.03		
199	2002/3/2	SS-AP-01-199	22 54'16"	89 13'23"	2534659	728010	48.8	87.6	7.04	-102.00	25.4	104.1	0.50		
200	2002/3/2	SS-AP-01-200	22 54'16"	89 13'23"	2534676	728034	50.3	89.4	6.99	-107.00	25.6	98.9	0.40		
201	2002/3/2	SS-AP-01-201	22 54'15"	89 13'23"	2534630	728034	UK	87.6	6.96	-94.00	25.7	111.9	0.50		
202	2002/3/2	SS-AP-01-202	22 54'15"	89 13'24"	2534625	728036	UK	94.7	6.93	-87.00	25.0	119.4	0.30		
203	2002/3/2	SS-AP-01-203	22 54'13"	89 13'25"	2534588	728070	UK	109.2	6.93	-101.00	25.5	105.0	0.50		
204	2002/3/2	SS-AP-01-204	22 54'13"	89 13'22"	2534582	727995	UK	96.6	6.99	-93.00	25.7	112.9	0.40		
205	2002/3/1	SS-AP-01-205	22 54'21"	89 13'18"	2534814	727868	UK	121.4	7.05	-98.00	25.0	108.4	0.50		
206	2002/3/1	SS-AP-01-206	22 54'22"	89 13'18"	2534845	727880	UK	110.7	7.09	-119.00	25.0	87.4	0.40		
207	2002/3/2	SS-AP-01-207	22 54'14"	89 13'22"	2534612	728008	UK	106.3	7.01	-90.00	25.8	115.8	0.50		
208	2002/3/2	SS-AP-01-208	22 54'14"	89 13'21"	2534590	727965	UK	101.7	6.94	-87.00	25.6	118.9	0.40		
209	2002/3/2	SS-AP-01-209	22 54'15"	89 13'22"	2534633	727996	UK	96.8	6.99	-100.00	25.4	106.1	0.40		
210	2002/3/2	SS-AP-01-210	22 54'14"	89 13'21"	2534595	727972	56.4	104.9	7.03	-112.00	25.9	93.7	0.20	0.19	
211	2002/3/2	SS-AP-01-211	22 54'16"	89 13'20"	2534638	727929	UK	109.8	7.05	-89.00	26.1	116.6	0.30		
212	2002/3/1	SS-AP-01-212	22 54'14"	89 13'20"	2534609	727949	UK	105.6	6.97	-92.00	25.7	113.9	0.20		
213	2002/3/2	SS-AP-01-213	22 54'13"	89 13'20"	2534571	727935	UK	95.4	7.01	-102.00	25.7	103.9	0.50		
214	2002/3/2	SS-AP-01-214	22 54'13"	89 13'19"	2534569	727918	65.5	97.5	6.99	-94.00	25.9	111.7	0.40		
215	2002/3/2	SS-AP-01-215	22 54'12"	89 13'19"	2534542	727912	70.1	102.2	6.98	-99	25.5	107.0	0.50		
216	2002/3/2	SS-AP-01-216	22 54'12"	89 13'22"	2534556	728007	70.1	91.6	6.90	-102	25.7	103.9	0.30		
217	2002/3/3	SS-AP-01-217	22 54'11"	89 13'23"	2534503	728020	UK	91.7	7.01	-94	26.1	111.6	0.30		
218	2002/3/3	SS-AP-01-218	22 54'11"	89 13'23"	2534495	728013	UK								Unused
219	2002/3/3	SS-AP-01-219	22 54'11"	89 13'22"	2534498	727998	38.1	93.8	6.99	-98	25.5	108.0	0.20		
220	2002/3/3	SS-AP-01-220	22 54'10"	89 13'23"	2534482	728039	61.0	93.9	7.05	-104	25.6	101.9	0.40	0.24	
221	2002/3/3	SS-AP-01-221	22 54'10"	89 13'23"	2534479	728032	48.8	84.7	6.93	-97	24.8	109.5	0.40		
222	2002/3/3	SS-AP-01-222	22 54'09"	89 13'23"	2534462	728034	62.5	92.9	6.97	-97	26.0	108.6	0.30		
223	2002/3/3	SS-AP-01-223	22 54'09"	89 13'23"	2534455	728023	70.1	101.3	6.97	-89	25.7	116.9	0.40		
224	2002/3/3	SS-AP-01-224	22 54'11"	89 13'15"	2534514	727791	61.0	97.8	6.97	-102	25.4	104.1	0.40		
225	2002/3/3	SS-AP-01-225	22 54'10"	89 13'15"	2534484	727796	UK	107.9	6.99	-89	25.3	117.2	0.30		
226	2002/3/3	SS-AP-01-226	22 54'08"	89 13'16"	2534400	727812	56.4	87.8	7.01	-92	25.4	114.1	0.40		
227	2002/3/1	SS-AP-01-227	22 54'15"	89 13'13"	2534640	727732	57.9	89.7	6.90	-90	25.0	116.4	0.20		
228	2002/3/3	SS-AP-01-228	22 54'18"	89 13'12"	2534711	727705	UK	101.7	7.03	-98	25.5	108.0	0.30		
229	2002/3/3	SS-AP-01-229	22 54'16"	89 13'12"	2534710	727717	UK	89.4	7.01	-92	25.4	114.1	0.40		
230	2002/3/3	SS-AP-02-01	22 54'28"	89 13'09"	2535033	727621	UK	80.4	7.07	-96	25.9	109.7	0.10		
231	2002/3/3	SS-AP-02-02	22 54'28"	89 13'09"	2535077	727614	UK	85.5	7.08	-90	25.8	115.8	0.09		
232	2002/3/3	SS-AP-02-03	22 54'27"	89 13'09"	2535012	727609	UK	76.2	7.09	-89	25.9	116.7	0.20		
233	2002/3/3	SS-AP-02-04	22 54'28"	89 13'08"	2535014	727597	UK	107.9	7.15	-110	26.3	95.4	0.20		
234	2002/3/3	SS-AP-02-05	22 54'29"	89 13'09"	2535069	727617	UK	93.6	6.98	-79	25.3	127.2	0.20		
235	2002/3/3	SS-AP-02-06	22 54'29"	89 13'09"	2535045	727605	UK	105.2	7.01	-118	26.1	87.6	0.20		
236	2002/3/3	SS-AP-02-07	22 54'29"	89 13'09"	2535073	727304	91.4	86.2	7.03	-105	25.8	100.8	0.10		
237	2002/3/3	SS-AP-02-08	22 54'30"	89 13'08"	2535104	727600	42.7	107.6	7.15	-103	26.2	102.5	0.20		
238	2002/3/3	SS-AP-02-09	22 54'29"	89 13'08"	2535073	727589	61.0	96.4	7.04	-103	26.2	102.5	0.20		
239	2002/3/3	SS-AP-02-10	22 54'29"	89 13'08"	2535071	727583	61.0	87.3	7.05	-93	25.4	113.1	0.40	0.16	
240	2002/3/3	SS-AP-02-11	22 54'30"	89 13'07"	2535075	727563	UK	81.9	7.00	-101	25.9	104.7	0.20		
241	2002/3/3	SS-AP-02-12	22 54'29"	89 13'07"	2535063	727572	UK	79.7	7.15	-92	26.0	113.6	0.20		
242	2002/3/3	SS-AP-02-13	22 54'29"	89 13'06"	2535058	727535	UK	75.8	7.00	-84	25.3	122.2	0.10		
243	2002/3/3	SS-AP-02-14	22 54'28"	89 13'06"	2535030	727538	48.8	89.2	7.13	-96	26.1	109.6	0.10		
244	2002/3/3	SS-AP-02-15	22 54'28"	89 13'05"	2535040	727510	UK	117.4	7.09	-108	26.3	97.4	0.10		
245	2002/3/3	SS-AP-02-16	22 54'28"	89 13'05"	2535038	727494	41.1	91.9	7.18	-89	25.9	116.7	0.20		
246	2002/3/3	SS-AP-02-17	22 54'28"	89 13'04"	2535010	727468	45.7	94.2	7.10	-91	26.1	114.6	0.20		
247	2002/3/3	SS-AP-02-18	22 54'28"	89 13'04"	2535031	727467	62.8	96.2	7.03	-92.6	26.0	113.0	0.20		
248	2002/3/3	SS-AP-02-19	22 54'28"	89 13'04"	2535020	727467	UK	115.3	7.04	-119	26.0	86.6	0.20		
249	2002/3/3	SS-AP-02-20	22 54'28"	89 13'03"	2535025	727434	51.8	113.6	7.06	-112	25.7	93.9	0.30	0.12	
250	2002/3/3	SS-AP-02-21	22 54'27"	89 13'03"	2534996	727445	UK	79.6	7.06	-94	26.1	111.6	0.20		
251	2002/3/3	SS-AP-02-22	22 54'28"	89 13'01"	2535022	727394	UK	79.6	7.15	-94	26.4	111.4	0.10		
252	2002/3/3	SS-AP-02-23	22 54'25"	89 13'01"	2535013	727398	UK	117.3	7.01	-108	26.3	97.4	0.20		
253	2002/3/3	SS-AP-02-24	22 54'29"	89 12'59"	2535049	727344	48.8	88.6	7.13	-96	26.0	109.6	0.20		
254	2002/3/3	SS-AP-02-25	22 54'28"	89 13'00"	2535029	727356	61.0	97.8	7.05	-90	25.9	115.7	0.10		
255	2002/3/3	SS-AP-02-26	22 54'27"	89 13'00"	2535003	727362	61.0	86.2	7.05	-103	25.1	103.3	0.10		
256	2002/3/3	SS-AP-02-27	22 54'28"	89 12'59"	2535033	727322	61.0	88.9	7.00	-97	25.8	108.8	0.10		
257	2002/3/3	SS-AP-02-28	22 54'28"	89 12'59"	2535029	727336	45.7	88.9	7.15	-107	26.1	98.6	0.09		
258	2002/3/3	SS-AP-02-29	22 54'28"	89 12'58"	2535033	727296	UK	91.8	7.10	-108	26.0	97.6	0.10		
259	2002/3/3	SS-AP-02-30	22 54'29"	89 12'58"	2535040	727301	UK	93.2	7.18	-113	26.0	92.6	0.10	0.16	
260	2002/3/3	SS-AP-02-31	22 54'29"	89 12'58"	2535046	727295	UK	70.8	7.02	-102	26.2	103.5	0.10		
261	2002/3/3	SS-AP-02-32	22 54'29"	89 12'58"	2535050	727294	61.0	89.2	7.12	-97	26.2	108.5	0.10		
262	2002/3/3	SS-AP-02-33	22 54'30"	89 12'58"	2535069	727297	61.0	84.2	7.11	-90	25.8	115.8	0.20		
263	2002/3/3	SS-AP-02-34	22 54'29"	89 12'57"	2535056	727266	UK								Unused
264	2002/3/3	SS-AP-02-35	22 54'29"	89 12'57"	2535064	727262	UK	77.3	7.11	-91	26.1	114.6	0.10		
265	2002/3/3	SS-AP-02-36	22 54'29"	89 12'54"	2535055	727190	54.9								Unused
266	2002/4/3	SS-AP-02-37	22 54'28"	89 12'54"	2535023	727194	UK	118.3	7.18	-121	216.4	-52.4	0.20		
267	2002/4/3	SS-AP-02-38	22 54'28"	89 12'56"	2535022	727236	UK								Unused
268	2002/4/3	SS-AP-02-39	22 54'29"	89 12'53"	2535054	727150	UK								Unused
269	2002/4/3	SS-AP-02-40	22 54'31"	89 12'51"	2535112	727110	45.7	76.8	7.05	-113	26.2	92.5	0.20		
270	2002/4/3	SS-AP-02-41	22 54'30"	89 12'51"	2535086	727108	51.8	93.4	7.17	-109	26.2	96.5	0.09		
271	2002/4/3	SS-AP-02-42	22 54'31"	89 12'51"	2535113	727089	UK	108.2	7.14	-102	25.4	104.1	0.10		
272	2002/4/3	SS-AP-02-43	22 54'31"	89 12'50"	2535104	727075	15.2	98.2	7.15	-118	26.6	87.2	0.10		
273	2002/4/3	SS-AP-02-44	22 54'27"	89 13'10"	2534995	727638	UK	117.8	7.08	-124	26.6	81.2	0.20		
274	2002/4/3	SS-AP-02-45	22 54'26"	89 13'11"	2534968	727611	51.8	83.2	7.12	-92	26.2	113.5	0.20		
275	2002/4/3	SS-AP-02-46	22 54'26"	89 13'10"	2534973	727644	UK	88.2	7.17	-114	26.3	91.4	0.10		
276	2002/4/3	SS-AP-02-47	22 54'26"	89 13'09"	2534976	727625	UK	97.2	7.07	-94	25.7	111.9	0.10		
277	2002/4/3	SS-AP-02-48	22 54'26"	89 13'08"	2534979	727581	54.9	78.2	7.18	-99	25.9	106.7	0.10		
278	2002/4/3	SS-AP-02-49	22 54'25"	89 13'06"	2534945	727541	UK	84.2	7.03	-98	26.0	107.6	0.09		
279	2002/4/3	SS-AP-02-50	22 54'26"	89 13'06"	2534957	727543	UK	97.2	7.12	-121	25.7	84.9	0.40	0.17	
280	2002/4/3	SS-AP-02-51	22 54'25"	89 13'06"	2534932	727537	UK	113.2	7.02	-123	26.2	82.5	0.10		
281	2002/4/3	SS-AP-02-52	22 54'25"	89 13'06"	2534936	727580	48.8	87.2	7.03	-87	25.7	118.9	0.20		
282	2002/4/3	SS-AP-02-53	22 54'27"	89 13'04"	2534994	727478	UK	96.4	7.13	-112	26.3	93.4	0.20		
283	2002/4/3	SS-AP-02-54	22 54'27"	89 13'02"	2534989	727425	UK	111.3	7.12	-97	26.3	108.4	0.20		
284	2002/4/3	SS-AP-02-55	22 54'27"	89 13'03"	2534999	727434	UK	97.2	7.04	-94	25.4	112.1	0.20		
285	2002/4/3	SS-AP-02-56	22 54'26"	89 13'02"	2534977	727429	UK	109.2	7.10	-99	26.6	106.2	0.20		
286	2002/4/3	SS-AP-02-57	22 54'24"	89 13'03"	2534913	727453	UK	87.4	7.14	-120	26.3	85.4	0.20		
287	2002/4/3	SS-AP-02-58	22 54'25"	89 13'02"	2534946	727427	UK	90.0	7.11	-97	26.0	108.6	0.10		
288	2002/4/3	SS-AP-02-59	22 54'26"	89 13'01"	2534948	727378	UK	98.2	7.08	-97	26.0	108.6	0.10		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
289	2002/4/3	SS-AP-02-60	22 54'25"	89 12'59"	2534941	727330	UK	94.7	7.06	-121	26.2	84.5	0.10	0.22	
290	2002/4/3	SS-AP-02-61	22 54'27"	89 13'00"	2534986	727353	UK	95.2	7.14	-103	25.6	102.9	0.10		
291	2002/4/3	SS-AP-02-62	22 54'27"	89 12'59"	2534987	727338	UK	70.6	7.01	-92	25.9	113.7	0.09		
292	2002/4/3	SS-AP-02-63	22 54'27"	89 12'59"	2534985	727343	61.0	79.3	7.18	-123	25.7	82.9	0.09		
293	2002/4/3	SS-AP-02-64	22 54'27"	89 12'59"	2535003	727336	45.7	83.5	7.17	-102	26.3	103.4	0.10		
294	2002/4/3	SS-AP-02-65	22 54'27"	89 12'59"	2535002	727337	45.7	121.2	7.17	-125	26.3	80.4	0.10		
295	2002/4/3	SS-AP-02-66	22 54'27"	89 12'57"	2535004	727280	97.5	87.3	7.05	-89	25.6	116.9	0.10		
296	2002/2/9	SS-AP-03-01	22 51'90"	89 15'44"	2530346	731599	UK	341.0	7.06	-84	26.1	121.6	0.50		
297	2002/2/9	SS-AP-03-02	22 51'88"	89 15'42"	2530313	731577	91.4	370.0	7.01	-92	25.4	114.1	0.40		
298	2002/2/9	SS-AP-03-03	22 51'91"	89 15'44"	2530372	731610	61.0	137.8	8.50	24	26.5	229.3	0.03	0.013	
299	2002/2/9	SS-AP-03-04	22 51'92"	89 15'41"	2530385	731556	298.7	135.7	8.40	17	26.6	222.2	0.03	0.015	
300	2002/2/9	SS-AP-03-05	22 51'95"	89 15'44"	2530442	731696	48.8	121.5	7.20	-102	26.4	103.4	0.60		
301	2002/2/9	SS-AP-03-06	22 52'10"	89 15'31"	2530698	731370	UK	85.3	7.07	-97	26.3	108.4	0.50		
302	2002/2/9	SS-AP-03-07	22 52'27"	89 15'21"	2531034	731198	UK	126.0	7.14	-108	26.2	97.5	0.40		
303	2002/2/9	SS-AP-03-08	22 52'28"	89 15'21"	2531037	731199	UK	93.8	7.16	-105	25.8	100.8	0.40		
304	2002/2/9	SS-AP-03-09	22 52'29"	89 15'21"	2531056	731204	UK	108.3	7.15	-110	25.7	95.9	0.30		
305	2002/2/9	SS-AP-03-10	22 52'29"	89 15'22"	2531067	731209	39.6	163.4	7.08	-117	26.1	88.6	0.30	0.18	
306	2002/2/9	SS-AP-03-11	22 52'29"	89 15'20"	2531056	731183	45.7	135.7	7.03	-112	26.1	93.6	0.40		
307	2002/2/9	SS-AP-03-12	22 52'30"	89 15'21"	2531081	731194	53.3	109.7	7.13	-117	25.9	88.7	0.30		
308	2002/2/9	SS-AP-03-13	22 52'31"	89 15'20"	2531105	731177	UK	98.6	7.19	-118	26.2	87.5	0.30		
309	2002/2/9	SS-AP-03-14	22 52'34"	89 15'18"	2531152	731158	21.3	117.5	7.11	-109	26.1	96.6	0.30		
310	2002/2/9	SS-AP-03-15	22 52'36"	89 15'17"	2531188	731125	59.4	103.7	7.02	-114	26.1	91.6	0.40		
311	2002/2/9	SS-AP-03-16	22 52'40"	89 15'14"	2531260	731080	56.4	123.4	7.13	-121	26.3	84.4	0.40		
312	2002/2/9	SS-AP-03-17	22 52'42"	89 15'13"	2531303	731056	UK	132.8	7.15	-124	26.2	81.5	0.20		
313	2002/2/10	SS-AP-03-18	22 52'51"	89 15'04"	2531463	730913	47.2	265.0	7.03	-109	26.3	96.4	0.40		
314	2002/2/10	SS-AP-03-19	22 52'62"	89 14'95"	2531674	730766	UK	154.6	7.09	-114	26.2	91.5	0.40		
315	2002/2/10	SS-AP-03-20	22 52'61"	89 14'94"	2531639	730729	UK	107.4	7.13	-108	25.7	97.9	0.30	0.086	
316	2002/2/10	SS-AP-03-21	22 52'62"	89 14'91"	2531658	730677	UK	112.7	7.02	-117	25.5	89.0	0.30	0.18	
317	2002/2/10	SS-AP-03-22	22 52'68"	89 14'84"	2531770	730565	UK	110.2	6.97	-114	25.8	91.8	0.30		
318	2002/2/10	SS-AP-03-23	22 52'69"	89 14'84"	2531818	730561	41.1	105.5	7.01	-106	25.6	99.9	0.50		
319	2002/2/10	SS-AP-03-24	22 52'69"	89 14'82"	2531784	730517	UK	118.5	6.97	-127	25.6	78.9	0.50		
320	2002/2/10	SS-AP-03-25	22 52'68"	89 14'80"	2531771	730484	39.6	106.2	7.10	-109	26.0	96.6	0.40		
321	2002/2/10	SS-AP-03-26	22 52'71"	89 14'80"	2531836	730486	UK	128.9	7.00	-123	25.8	82.8	0.40		
322	2002/2/10	SS-AP-03-27	22 52'72"	89 14'81"	2531840	730512	UK	83.7	7.03	-110	25.1	96.3	0.40		
323	2002/2/10	SS-AP-03-28	22 52'75"	89 14'82"	2531904	730520	UK	98.7	7.07	-118	25.4	88.1	0.40		
324	2002/2/10	SS-AP-03-29	22 52'75"	89 14'82"	2531887	730520	57.9	106.7	7.02	-121	25.5	85.0	0.50		
325	2002/2/10	SS-AP-03-30	22 52'73"	89 14'78"	2531864	730452	44.2	102.3	7.01	-103	25.7	102.9	0.30	0.18	
326	2002/2/10	SS-AP-03-31	22 52'75"	89 14'79"	2531895	730471	UK	98.8	7.15	-107	25.8	98.8	0.30		
327	2002/2/10	SS-AP-03-32	22 52'75"	89 14'77"	2531901	730439	48.8	97.5	7.00	-120	25.6	85.9	0.50		
328	2002/2/10	SS-AP-03-33	22 52'71"	89 14'76"	2531832	730417	UK	113.7	7.03	-131	25.8	74.8	0.50		
329	2002/2/10	SS-AP-03-34	22 52'73"	89 14'74"	2531868	730384	56.4	108.7	7.13	-122	25.4	84.1	0.40		
330	2002/2/10	SS-AP-03-35	22 52'75"	89 14'74"	2531895	730382	UK	127.0	7.17	-113	25.6	92.9	0.40		
331	2002/2/12	SS-AP-03-36	22 52'79"	89 14'70"	2531983	730315	56.4								Unused
332	2002/2/12	SS-AP-03-37	22 52'80"	89 14'70"	2531994	730311	64.0	93.2	7.03	-94	26.0	111.6	0.40		
333	2002/2/12	SS-AP-03-38	22 52'78"	89 14'66"	2531944	730243	UK	85.2	7.07	-102	26.1	103.6	0.50		
334	2002/2/12	SS-AP-03-39	22 52'75"	89 14'66"	2531901	730242	UK	84.3	7.05	-107	25.8	98.8	0.50		
335	2002/2/12	SS-AP-03-40	22 52'72"	89 14'69"	2531841	730303	56.4	94.7	7.20	-94	25.9	111.7	0.40	0.20	
336	2002/2/12	SS-AP-03-41	22 52'71"	89 14'72"	2531823	730357	UK	221.0	7.19	-101	25.6	104.9	0.50		
337	2002/2/12	SS-AP-03-42	22 52'71"	89 14'74"	2531822	730380	48.8	131.2	7.10	-97	25.5	109.0	0.50		
338	2002/2/12	SS-AP-03-43	22 52'73"	89 14'66"	2531864	730249	UK	90.3	7.18	-105	26.0	100.6	0.40		
339	2002/2/12	SS-AP-03-44	22 52'72"	89 14'65"	2531837	730227	62.5	87.5	7.21	-92	25.7	113.9	0.40		
340	2002/2/12	SS-AP-03-45	22 52'72"	89 14'62"	2531835	730183	UK	96.3	7.13	-94	25.8	111.8	0.40		
341	2002/2/12	SS-AP-03-46	22 52'76"	89 14'53"	2531906	730022	UK	106.7	7.09	-108	26.0	97.6	0.40		
342	2002/2/12	SS-AP-03-47	22 52'75"	89 14'51"	2531893	729996	73.2	94.3	7.11	-113	26.2	92.5	0.50		
343	2002/2/12	SS-AP-03-48	22 52'77"	89 14'49"	2531925	729959	UK	117.8	7.18	-110	26.0	95.6	0.40		
344	2002/2/12	SS-AP-03-49	22 52'82"	89 14'49"	2532011	729957	48.8	123.2	7.09	-107	26.3	98.4	0.50		
345	2002/2/12	SS-AP-03-50	22 52'76"	89 14'47"	2531917	729925	51.8	118.7	7.03	-113	26.1	92.6	0.40	0.18	
346	2002/2/12	SS-AP-03-51	22 52'75"	89 14'46"	2531885	729904	51.8								Unused
347	2002/2/12	SS-AP-03-52	22 52'79"	89 14'48"	2531858	729948	48.8	97.6	6.98	-119	25.8	86.8	0.40		
348	2002/2/12	SS-AP-03-53	22 52'80"	89 14'46"	2531980	729906	51.8	87.5	7.01	-108	25.7	97.9	0.50		
349	2002/2/12	SS-AP-03-54	22 52'81"	89 14'46"	2531000	729910	48.8	91.3	7.08	-111	25.9	94.7	0.50		
350	2002/2/12	SS-AP-03-55	22 52'81"	89 14'46"	2531014	729915	42.7	135.2	7.13	-127	25.9	78.7	0.50		
351	2002/2/12	SS-AP-03-56	22 52'78"	89 14'43"	2531937	729859	51.8	127.7	7.17	-127	26.0	78.6	0.50		
352	2002/2/13	SS-AP-03-57	22 52'75"	89 14'35"	2531907	729724	48.8	87.3	7.13	-92	25.0	114.4	0.50		
353	2002/2/13	SS-AP-03-58	22 52'80"	89 14'31"	2531979	729642	UK	89.7	7.09	-108	25.5	98.0	0.30		
354	2002/2/13	SS-AP-03-59	22 52'81"	89 14'29"	2532004	729618	UK								Unused
355	2002/2/13	SS-AP-03-60	22 52'80"	89 14'27"	2531978	729587	35.1	102.5	7.21	-113	25.4	93.1	0.30	0.34	
356	2002/2/13	SS-AP-03-61	22 52'83"	89 14'28"	2532038	729595	36.6	94.7	7.03	-96	25.8	109.8	0.50		
357	2002/2/13	SS-AP-03-62	22 52'82"	89 14'28"	2532034	729699	51.8	108.7	7.14	-107	25.4	99.1	0.30		
358	2002/2/13	SS-AP-03-63	22 52'82"	89 14'24"	2532010	729533	UK	113.3	7.19	-121	25.9	84.7	0.40		
359	2002/2/13	SS-AP-03-64	22 52'85"	89 14'25"	2532078	729536	UK	84.7	7.09	-101	25.3	105.2	0.40		
360	2002/2/13	SS-AP-03-65	22 52'85"	89 14'22"	2532061	729485	UK	98.8	7.16	-104	25.7	101.9	0.30		
361	2002/2/13	SS-AP-03-66	22 52'84"	89 14'22"	2532048	729487	UK	110.7	7.28	-84	24.9	122.4	0.50		
362	2002/2/13	SS-AP-03-67	22 52'87"	89 14'22"	2532109	729503	UK	90.6	7.26	-123	24.6	83.7	0.50		
363	2002/2/13	SS-AP-03-68	22 52'77"	89 14'29"	2531918	729620	UK	123.7	7.21	-131	25.1	75.3	0.50		
364	2002/2/13	SS-AP-03-69	22 53'03"	89 14'58"	2532414	730105	UK	84.7	7.18	-103	26.1	102.6	0.50		
365	2002/2/13	SS-AP-03-70	22 53'02"	89 14'59"	2532401	730118	UK	98.4	7.25	-115	26.2	90.5	0.50	0.36	
366	2002/2/13	SS-AP-03-71	22 53'00"	89 14'58"	2532352	730098	UK	81.6	7.08	-92	25.8	113.8	0.40		
367	2002/2/13	SS-AP-03-72	22 53'00"	89 14'57"	2532366	730085	61.0	81.0	7.19	-95	26.2	110.5	0.50		
368	2002/2/13	SS-AP-03-73	22 53'02"	89 14'57"	2532417	730080	UK	85.7	7.14	-108	26.0	97.6	0.50		
369	2002/2/13	SS-AP-03-74	22 53'02"	89 14'37"	2534213	728010	UK	97.3	7.18	-110	25.6	95.9	0.40		
370	2002/2/13	SS-AP-03-75	22 53'97"	89 13'36"	2534105	727997	53.3	78.3	7.01	-89	26.1	116.6	0.40		
371	2002/2/13	SS-AP-03-76	22 53'96"	89 13'40"	2534105	728058	UK	81.0	7.12	-93	25.6	112.9	0.50		
372	2002/2/13	SS-AP-03-77	22 53'96"	89 13'39"	2534081	728045	UK	87.6	7.08	-89	25.8	116.8	0.40		
373	2002/2/13	SS-AP-03-78	22 53'96"	89 13'37"	2534086	728010	51.8	79.3	7.18	-110	25.6	95.9	0.40		
374	2002/2/13	SS-AP-03-79	22 53'95"	89 13'37"	2534073	728005	UK	83.6	7.23	-115	25.8	90.8	0.50		
375	2002/2/13	SS-AP-03-80	22 53'96"	89 13'36"	2534097	727978	56.4	94.3	7.21	-124	26.1	81.6	0.40	0.12	
376	2002/2/14	SS-AP-03-81	22 53'94"	89 13'37"	2534061	728009	UK	91.8	7.10	-103	25.9	102.7	0.40		
377	2002/2/14	SS-AP-03-82	22 53'94"	89 13'37"	2534061	728015	61.0	71.2	7.03	-91	25.1	115.3	0.50		
378	2002/2/14	SS-AP-03-83	22 53'94"	89 13'36"	2534065	727992	38.1	78.6	7.09	-84	24.9	122.4	0.50		
379	2002/2/14	SS-AP-03-84	22 53'94"	89 13'35"	2534053	727970	48.8	91.3	7.17	-102	25.2	104.2	0.50		
380	2002/2/14	SS-AP-03-85	22 53'94"	89 13'34"	2534051	727996	UK	83.4	7.19	-94	24.8	112.5	0.40		
381	2002/2/14	SS-AP-03-86	22 53'94"	89 13'34"	2534058	727951	42.7	76.8	7.01	-107	25.1	99.3	0.50		
382	2002/2/14	SS-AP-03-87	22 53'95"	89 13'34"	2534079	727950	56.4	93.5	7.23	-113	24.9	93.4	0.40		
383	2002/2/14	SS-AP-03-88	22 53'96"	89 13'34"	2534084	727944	UK	71.2	7.08	-91	25.3	115.2	0.50		
384	2002/2/14	SS-AP-03-89	22 53'97"	89 13'34"	2534084	727955	UK	81.6	7.13	-101	25.2	105.2	0.40		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
385	2002/2/14	SS-AP-03-90	22 53'95"	89 13'31"	2534077	727901	UK	87.4	7.21	-98	25.1	108.3	0.40	0.14	
386	2002/2/14	SS-AP-03-91	22 53'91"	89 13'33"	2534020	727938	56.4	84.3	7.19	-108	25.0	98.4	0.50		
387	2002/2/14	SS-AP-03-92	22 53'90"	89 13'30"	2533991	727893	UK	71.2	7.01	-93	25.4	113.1	0.30		
388	2002/2/14	SS-AP-03-93	22 53'92"	89 13'31"	2534008	727897	48.8	73.1	7.13	-108	26.0	97.6	0.40		
389	2002/2/14	SS-AP-03-94	22 53'92"	89 13'27"	2534020	727843	UK	93.2	7.23	-118	25.9	87.7	0.30		
390	2002/2/14	SS-AP-03-95	22 53'92"	89 13'27"	2534024	727838	UK	97.6	7.17	-123	25.4	83.1	0.30		
391	2002/2/14	SS-AP-03-96	22 53'95"	89 13'25"	2534047	727829	48.8	103.0	7.03	-104	26.0	101.6	0.50		
392	2002/2/14	SS-AP-03-97	22 53'93"	89 13'27"	2534034	727842	51.8	110.8	7.17	-127	25.9	78.7	0.50		
393	2002/2/14	SS-AP-03-98	22 53'91"	89 13'28"	2534025	727346	56.4	121.3	7.11	-120	26.0	85.6	0.50		
394	2002/2/14	SS-AP-03-99	22 53'93"	89 13'28"	2534046	727853	56.4	94.6	7.00	-101	26.2	104.5	0.30		
395	2002/2/14	SS-AP-03-100	22 53'88"	89 13'29"	2533944	727979	38.1	118.6	7.05	-126	26.1	79.6	0.40	0.13	
396	2002/2/14	SS-AP-03-101	22 54'02"	89 13'34"	2534212	727957	48.8								Unused
397	2002/2/14	SS-AP-03-102	22 54'08"	89 13'28"	2534321	727847	UK	79.4	7.19	-94	24.8	112.5	0.40		
398	2002/2/14	SS-AP-03-103	22 54'08"	89 13'25"	2534315	727795	UK	85.6	7.27	-98	24.9	108.4	0.50		
399	2002/2/14	SS-AP-03-104	22 54'12"	89 13'23"	2534398	727761	64.0	73.9	7.04	-105	25.0	101.4	0.40		
400	2002/2/14	SS-AP-03-105	22 54'07"	89 13'21"	2534286	727734	UK	79.8	7.21	-98	25.4	108.1	0.40		
401	2002/2/14	SS-AP-03-106	22 54'06"	89 13'19"	2534286	727703	51.8	89.3	7.18	-107	25.7	98.9	0.30		
402	2002/2/14	SS-AP-03-107	22 54'05"	89 13'19"	2534275	727690	64.0	69.4	7.11	-88	25.6	117.9	0.30		
403	2002/2/14	SS-AP-03-108	22 54'04"	89 13'20"	2534232	727718	64.0	91.3	7.23	-115	25.9	90.7	0.40		
404	2002/2/14	SS-AP-03-109	22 54'05"	89 13'16"	2534258	727641	24.4	112.7	7.20	-116	26.0	89.6	0.30		
405	2002/2/14	SS-AP-03-110	22 54'04"	89 13'16"	2534241	727654	42.7	131.5	7.25	-131	25.7	74.9	0.40	0.098	
406	2002/2/14	SS-AP-03-111	22 54'01"	89 13'14"	2534181	727609	UK								Unused
407	2002/2/16	SS-AP-03-112	22 54'12"	89 13'19"	2534385	727715	UK	80.8	7.06	-89	24.6	117.7	0.40		
408	2002/2/16	SS-AP-03-113	22 54'14"	89 13'20"	2534428	727710	73.2	75.6	7.02	-94	24.9	112.4	0.40		
409	2002/2/16	SS-AP-03-114	22 54'12"	89 13'11"	2534494	727561	64.0	75.6	7.21	-103	25.1	103.3	0.40		
410	2002/2/16	SS-AP-03-115	22 54'13"	89 13'08"	2534550	727589	57.9	81.2	7.13	-109	25.1	97.3	0.50		
411	2002/2/16	SS-AP-03-116	22 54'17"	89 13'12"	2534479	727580	UK								Unused
412	2002/2/16	SS-AP-03-117	22 54'07"	89 13'07"	2534369	727574	56.4	78.3	7.03	-117	24.7	89.6	0.30		
413	2002/2/16	SS-AP-03-118	22 54'07"	89 13'06"	2534364	727564	UK	71.8	7.11	-110	24.6	96.7	0.30		
414	2002/2/16	SS-AP-03-119	22 54'08"	89 13'07"	2534409	727569	UK	84.6	7.01	-97	24.8	109.5	0.40		
415	2002/2/16	SS-AP-03-120	22 54'05"	89 13'05"	2534323	727516	56.4	91.3	7.19	-121	25.1	85.3	0.30		
416	2002/2/16	SS-AP-03-121	22 54'06"	89 13'04"	2534362	727478	61.0	86.7	7.08	-103	25.0	103.4	0.30		
417	2002/2/16	SS-AP-03-122	22 54'07"	89 13'04"	2534377	727483	UK								Unused
418	2002/2/16	SS-AP-03-123	22 54'07"	89 13'06"	2534390	727546	47.2								Unused
419	2002/2/16	SS-AP-03-124	22 54'08"	89 13'02"	2534410	727439	UK	76.9	7.15	-113	25.0	93.4	0.40		
420	2002/2/16	SS-AP-03-125	22 54'09"	89 13'05"	2534434	727522	56.4	71.0	7.09	-92	25.2	114.2	0.30		
421	2002/2/16	SS-AP-03-126	22 54'10"	89 13'04"	2534465	727477	UK	91.7	7.11	-97	25.0	109.4	0.30		
422	2002/2/16	SS-AP-03-127	22 54'09"	89 13'02"	2534469	727441	UK	84.3	7.17	-102	25.1	104.3	0.40		
423	2002/2/16	SS-AP-03-128	22 54'11"	89 13'06"	2534493	727527	51.8	70.2	7.14	-89	24.9	117.4	0.30		
424	2002/2/16	SS-AP-03-129	22 54'17"	89 13'10"	2534474	727535	UK	108.4	7.18	-96	25.2	110.2	0.40		
425	2002/2/16	SS-AP-03-130	22 54'16"	89 13'09"	2534454	727525	UK	123.6	7.19	-121	25.3	85.2	0.30		
426	2002/2/16	SS-AP-03-131	22 54'13"	89 13'06"	2534562	727523	68.6	98.6	7.16	-118	25.2	88.2	0.50		
427	2002/2/16	SS-AP-03-132	22 54'20"	89 13'10"	2534533	727543	UK	89.8	7.11	-114	24.9	92.4	0.50		
428	2002/2/16	SS-AP-03-133	22 54'19"	89 13'19"	2534515	727472	79.2	69.3	7.01	-112	25.3	94.2	0.40		
429	2002/2/16	SS-AP-03-134	22 54'21"	89 13'05"	2534522	727463	UK	83.1	7.08	-104	25.4	102.1	0.40		
430	2002/2/16	SS-AP-03-135	22 54'16"	89 13'03"	2534521	727459	UK	71.6	7.02	-97	25.1	109.3	0.40		
431	2002/2/17	SS-AP-03-136	22 54'11"	89 13'02"	2534508	727430	42.7	103.2	7.09	-123	24.8	83.5	0.40		
432	2002/2/17	SS-AP-03-137	22 54'13"	89 13'06"	2534549	727547	UK	113.7	7.18	-119	25.1	87.3	0.40		
433	2002/2/17	SS-AP-03-138	22 54'10"	89 13'05"	2534478	727521	UK								Unused
434	2002/2/17	SS-AP-03-139	22 54'22"	89 13'10"	2534585	727535	64.0	108.2	7.21	-120	25.2	86.2	0.40		
435	2002/2/17	SS-AP-03-140	22 54'14"	89 13'06"	2534585	727539	UK	121.7	7.17	-115	25.3	91.2	0.30		
436	2002/2/17	SS-AP-03-141	22 54'13"	89 13'03"	2534551	727446	47.2	126.3	7.15	-110	25.2	96.2	0.40		
437	2002/2/17	SS-AP-03-142	22 54'22"	89 13'05"	2534569	727455	70.1	121.3	7.06	-97	25.0	109.4	0.30		
438	2002/2/17	SS-AP-03-143	22 54'12"	89 13'02"	2534539	727436	33.5	109.7	7.14	-92	25.0	114.4	0.30		
439	2002/2/17	SS-AP-03-144	22 54'12"	89 13'02"	2534522	727425	UK								Unused
440	2002/2/17	SS-AP-03-145	22 54'12"	89 13'05"	2534537	727500	61.0	131.0	7.21	-119	24.6	87.7	0.30		
441	2002/2/17	SS-AP-03-146	22 54'24"	89 13'13"	2534603	727583	54.9	73.2	7.18	-92	25.4	114.1	0.30		
442	2002/2/17	SS-AP-03-147	22 54'23"	89 13'13"	2534592	727585	54.9	70.4	7.09	-99	26.3	106.4	0.40		
443	2002/2/17	SS-AP-03-148	22 54'21"	89 13'13"	2534552	727588	25.9	70.2	7.13	-113	26.2	92.5	0.40		
444	2002/2/17	SS-AP-03-149	22 54'22"	89 13'13"	2534574	727595	54.9	81.2	7.19	-108	26.1	97.6	0.40		
445	2002/2/17	SS-AP-03-150	22 54'22"	89 13'14"	2534594	727605	50.3	69.4	7.23	-108	26.0	97.6	0.40		
446	2002/2/17	SS-AP-03-151	22 54'22"	89 13'15"	2534577	727624	UK	64.5	7.23	-97	25.8	108.8	0.40		
447	2002/2/17	SS-AP-03-152	22 54'23"	89 13'15"	2534587	727623	53.3	66.6	7.12	-108	26.2	97.5	0.30		
448	2002/2/17	SS-AP-03-153	22 54'23"	89 13'15"	2534601	727620	51.8	71.3	7.18	-105	25.7	100.9	0.30		
449	2002/2/17	SS-AP-03-154	22 54'24"	89 13'14"	2534601	727604	56.4	71.1	7.16	-113	26.3	92.4	0.30		
450	2002/2/17	SS-AP-03-155	22 54'22"	89 13'17"	2534570	727655	51.8	68.3	7.23	-97	25.8	108.8	0.20		
451	2002/2/17	SS-AP-03-156	22 54'22"	89 13'18"	2534578	727682	59.4	78.2	7.08	-103	25.0	103.4	0.40		
452	2002/2/17	SS-AP-03-157	22 54'23"	89 13'09"	2534605	727523	13.7	73.6	7.11	-109	25.1	97.3	0.20		
453	2002/2/17	SS-AP-03-158	22 54'24"	89 13'11"	2534602	727552	25.9	71.2	7.02	-97	25.1	109.3	0.20		
454	2002/2/17	SS-AP-03-159	22 54'24"	89 13'10"	2534599	727545	UK	83.6	7.13	-115	24.9	91.4	0.30		
455	2002/2/17	SS-AP-03-160	22 54'25"	89 13'09"	2534628	727529	27.4	97.4	7.18	-123	25.4	83.1	0.30	0.12	
456	2002/2/17	SS-AP-03-161	22 54'23"	89 13'13"	2534647	727555	24.4	86.7	7.06	-115	25.8	90.8	0.20		
457	2002/2/18	SS-AP-03-162	22 54'27"	89 13'09"	2534659	727526	UK	91.5	7.17	-120	25.7	85.9	0.20		
458	2002/2/18	SS-AP-03-163	22 54'25"	89 13'12"	2534638	727571	UK	87.8	7.15	-127	25.4	79.1	0.30		
459	2002/2/27	SS-AP-03-164	22 54'27"	89 13'10"	2534658	727545	54.9	72.6	6.93	-73	26.4	132.4	0.20		
460	2002/2/27	SS-AP-03-165	22 54'27"	89 13'10"	2534672	727528	UK	70.1	7.01	-79	26.4	126.4	0.08		
461	2002/2/27	SS-AP-03-166	22 54'27"	89 13'09"	2534660	727525	51.8	69.4	6.97	-92	26.2	113.5	0.09		
462	2002/2/27	SS-AP-03-167	22 54'27"	89 13'10"	2534671	727528	61.0	73.4	7.00	-97	25.8	108.8	0.20		
463	2002/2/27	SS-AP-03-168	22 54'27"	89 13'08"	2534657	727500	UK	68.2	7.00	-89	25.8	116.8	0.08		
464	2002/2/27	SS-AP-03-169	22 54'26"	89 13'06"	2534638	727475	25.9	69.7	7.05	-94	26.0	111.6	0.02		
465	2002/2/27	SS-AP-03-170	22 54'28"	89 13'08"	2534677	727505	53.3	63.7	7.06	-68	26.3	137.4	0.08	0.097	
466	2002/2/27	SS-AP-03-171	22 54'29"	89 13'09"	2534693	727519	UK	71.3	7.11	-114	26.0	91.6	0.50		
467	2002/2/27	SS-AP-03-172	22 54'28"	89 13'12"	2534718	727457	UK	73.5	7.02	-98	26.1	107.6	0.40		
468	2002/2/27	SS-AP-03-173	22 54'30"	89 13'05"	2534713	727451	UK	63.4	7.19	-93	25.6	112.9	0.20		
469	2002/2/27	SS-AP-03-174	22 54'31"	89 13'07"	2534722	727483	UK	74.6	7.12	-107	26.2	98.5	0.40		
470	2002/2/27	SS-AP-03-175	22 54'30"	89 13'00"	2534715	727374	UK	71.8	7.06	-112	26.3	93.4	0.40		
471	2002/2/27	SS-AP-03-176	22 54'30"	89 13'00"	2534714	727356	UK								Unused
472	2002/2/27	SS-AP-03-177	22 54'27"	89 12'99"	2534658	727353	UK								Unused
473	2002/2/27	SS-AP-03-178	22 54'26"	89 12'99"	2534635	727344	44.2	80.3	7.03	-109	25.6	96.9	0.30		
474	2002/2/27	SS-AP-03-179	22 54'26"	89 13'01"	2534652	727381	UK								Unused
475	2002/2/27	SS-AP-03-180	22 54'33"	89 13'04"	2534778	727428	68.6	80.0	7.21	-115	26.1	90.6	0.30	0.28	
476	2002/2/27	SS-AP-03-181	22 54'32"	89 13'08"	2534761	727500	UK	64.7	7.10	-102	25.8	103.8	0.20		
477	2002/2/27	SS-AP-03-182	22 54'34"	89 13'07"	2534797	727484	UK	71.4	7.03	-92	26.0	113.6	0.20		
478	2002/2/27	SS-AP-03-183	22 54'35"	89 13'05"	2534807	727447	UK	78.2	7.11	-105	25.8	100.8	0.08		
479	2002/2/28	SS-AP-03-184	22 54'35"	89 13'04"	2534821	727423	53.3	82.5	7.05	-93	25.7	112.9	0.10		
480	2002/2/28	SS-AP-03-185	22 54'36"	89 13'05"	2534825	727446	UK	80.7	7.00	-90	25.8	115.8	0.10		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
481	2002/2/28	SS-AP-03-186	22 54'35"	89 13'07"	2534813	727485	30.5	72.6	7.09	-103	25.9	102.7	0.09		
482	2002/2/28	SS-AP-03-187	22 54'37"	89 13'06"	2534836	727466	21.3	69.8	7.11	-109	26.0	96.6	0.10		
483	2002/2/28	SS-AP-03-188	22 54'38"	89 13'07"	2534846	727476	UK	87.2	7.15	-112	26.1	93.6	0.09		
484	2002/2/28	SS-AP-03-189	22 54'36"	89 13'07"	2534831	727487	UK								Unused
485	2002/2/28	SS-AP-03-190	22 54'36"	89 13'08"	2534832	727505	48.8	79.3	7.06	-108	26.3	97.4	0.20	0.23	
486	2002/2/28	SS-AP-03-191	22 54'36"	89 13'09"	2534828	727511	UK	86.2	7.03	-102	26.0	103.6	0.20		
487	2002/2/28	SS-AP-03-192	22 54'35"	89 13'10"	2534819	727541	115.8	80.0	7.12	-91	26.4	114.4	0.20		
488	2002/2/28	SS-AP-03-193	22 54'36"	89 13'11"	2534829	727552	UK	91.2	7.07	-113	26.3	92.4	0.10		
489	2002/2/28	SS-AP-03-194	22 54'35"	89 13'12"	2534809	727578	UK	67.4	6.98	-89	26.0	116.6	0.10		
490	2002/2/28	SS-AP-03-195	22 54'37"	89 13'14"	2534843	727598	UK	79.8	7.04	-79	25.9	126.7	0.08		
491	2002/2/28	SS-AP-03-196	22 54'34"	89 13'10"	2534893	727557	UK	120.4	7.33	-21	26.7	184.1	0.08		
492	2002/2/28	SS-AP-03-197	22 54'33"	89 13'09"	2534780	727520	UK	69.3	7.16	-81	26.3	124.4	0.08		
493	2002/2/28	SS-AP-03-198	22 54'33"	89 13'09"	2534771	727520	UK	81.0	7.13	-79	26.2	126.5	0.09		
494	2002/2/28	SS-AP-03-199	22 54'34"	89 13'15"	2534807	727519	UK								Unused
495	2002/2/28	SS-AP-03-200	22 54'36"	89 13'15"	2534827	727526	56.4	86.3	7.11	-93	26.3	112.4	0.10	0.24	
496	2002/3/1	SS-AP-03-201	22 54'34"	89 13'15"	2534803	727527	350.5	94.4	6.97	-78	26.6	127.2	0.01	0.0052	
497	2002/3/1	SS-AP-03-202	22 54'35"	89 13'16"	2534806	727542	UK								Unused
498	2002/3/1	SS-AP-03-203	22 54'32"	89 13'12"	2534758	727568	UK								Unused
499	2002/3/1	SS-AP-03-204	22 54'32"	89 13'11"	2534749	727553	UK								Unused
500	2002/3/1	SS-AP-03-205	22 54'34"	89 13'15"	2534803	727613	350.5	69.3	7.89	-78	27.0	126.9	0.00	0.0072	
501	2002/3/1	SS-AP-03-206	22 54'30"	89 13'19"	2534725	727682	45.7	82.8	7.11	-87	26.5	118.3	0.09		
502	2002/3/1	SS-AP-03-207	22 54'30"	89 13'16"	2534700	727656	73.2	86.0	7.19	-84	26.2	121.5	0.10		
503	2002/3/1	SS-AP-03-208	22 54'36"	89 13'17"	2534817	727658	48.8	76.4	7.15	-84	26.4	121.4	0.10		
504	2002/3/1	SS-AP-03-209	22 54'38"	89 13'19"	2534863	727688	56.4	98.8	7.16	-101	26.6	104.2	0.09		
505	2002/3/1	SS-AP-03-210	22 54'38"	89 13'17"	2534862	727653	UK	93.6	7.13	-109	26.5	96.3	0.08	0.17	
506	2002/3/1	SS-AP-03-211	22 54'37"	89 13'16"	2534851	727630	61.0	73.7	7.09	-81	26.2	124.5	0.10		
507	2002/3/1	SS-AP-03-212	22 54'38"	89 13'15"	2534857	727613	UK	69.4	7.13	-97	26.3	108.4	0.08		
508	2002/3/1	SS-AP-03-213	22 54'38"	89 13'14"	2534864	727611	UK	76.2	7.19	-97	26.6	108.2	0.08		
509	2002/3/1	SS-AP-03-214	22 54'36"	89 13'17"	2534839	727649	UK	83.2	7.04	-81	26.5	124.3	0.08		
510	2002/3/1	SS-AP-03-215	22 54'37"	89 13'14"	2534852	727697	UK	78.9	7.11	-102	26.3	103.4	0.09		
511	2002/3/1	SS-AP-03-216	22 54'39"	89 13'14"	2534893	727595	UK	80.0	7.05	-91	26.7	114.1	0.08		
512	2002/3/1	SS-AP-03-217	22 54'39"	89 13'12"	2534885	727567	67.1	89.7	7.10	-105	26.6	100.2	0.09		
513	2002/3/1	SS-AP-03-218	22 54'40"	89 13'12"	2534906	727567	51.8								Unused
514	2002/3/1	SS-AP-03-219	22 54'41"	89 13'13"	2534913	727591	61.0	87.3	7.01	-99	26.2	106.5	0.09		
515	2002/3/1	SS-AP-03-220	22 54'42"	89 13'11"	2534938	727553	UK	94.3	7.03	-112	26.2	93.5	0.02	0.013	
516	2002/3/1	SS-AP-03-221	22 54'42"	89 13'12"	2534931	727575	UK	79.2	7.16	-95	26.0	110.6	0.07		
517	2002/3/1	SS-AP-03-222	22 54'42"	89 13'12"	2534943	727563	UK	89.2	7.13	-102	26.3	103.4	0.08		
518	2002/3/1	SS-AP-03-223	22 54'38"	89 13'09"	2534960	727513	61.0	82.8	7.01	-91	27.0	113.9	0.09		
519	2002/3/1	SS-AP-03-224	22 54'39"	89 13'08"	2534885	727508	UK	79.3	7.07	-87	26.8	118.1	0.09		
520	2002/3/1	SS-AP-03-225	22 54'40"	89 13'07"	2534914	727476	UK	91.2	7.11	-81.00	27.0	123.9	0.90		
521	2002/2/3	SS-AP-03-226	22 54'35"	89 13'03"	2534810	727412	47.2	89.4	7.17	-92.00	26.5	113.3	0.08		
522	2002/2/3	SS-AP-03-227	22 54'35"	89 13'03"	2534812	727412	48.8								Unused
523	2002/2/3	SS-AP-03-228	22 54'35"	89 13'02"	2534812	727392	UK	81.4	7.18	-89.00	26.6	116.2	0.08		
524	2002/2/3	SS-AP-03-229	22 54'36"	89 13'02"	2534822	727390	51.8								Unused
525	2002/2/3	SS-AP-03-230	22 54'36"	89 13'00"	2534829	727363	61.0	87.0	7.19	-97.00	26.4	108.4	0.09	0.084	
526	2002/2/3	SS-AP-03-231	22 54'36"	89 12'98"	2534828	727323	UK	79.8	7.07	-85.00	25.8	120.8	0.10		
527	2002/2/3	SS-AP-03-232	22 54'35"	89 12'97"	2534797	727320	44.2	82.3	7.05	-94.00	25.7	111.9	0.09		
528	2002/2/3	SS-AP-03-233	22 54'34"	89 12'97"	2534793	727307	UK	87.8	7.09	-98.00	26.0	107.6	0.10		
529	2002/2/3	SS-AP-03-234	22 54'33"	89 12'96"	2534773	727302	56.4	79.3	6.98	-89.00	25.4	117.1	0.08		
530	2002/2/3	SS-AP-03-235	22 54'32"	89 12'97"	2534756	727321	61.0	72.8	7.01	-90.00	25.5	116.0	0.09		
531	2002/2/3	SS-AP-03-236	22 54'32"	89 12'97"	2534749	727318	56.4	92.3	7.10	-102.00	26.1	103.6	0.09		
532	2002/2/3	SS-AP-03-237	22 54'32"	89 12'96"	2534743	727297	UK	81.4	7.06	-94.00	26.4	111.4	0.10		
533	2002/2/3	SS-AP-03-238	22 54'36"	89 12'96"	2534826	727292	UK	76.2	7.12	-105.00	26.2	100.5	0.10		
534	2002/2/3	SS-AP-03-239	22 54'38"	89 13'12"	2534865	727564	68.6	78.2	7.08	-87.00	26.3	118.4	0.10		
535	2002/2/3	SS-AP-03-240	22 54'36"	89 12'96"	2534830	727290	UK	73.2	7.24	-113.00	27.0	91.9	0.10	0.18	
536	2002/2/3	SS-AP-03-241	22 54'37"	89 12'93"	2534844	727251	UK	81.6	7.18	-108.00	27.1	96.9	0.09		
537	2002/2/3	SS-AP-03-242	22 54'40"	89 12'92"	2534900	727232	UK	97.4	7.89	-39.00	27.4	165.6	0.00	0.0024	
538	2002/2/3	SS-AP-03-243	22 54'31"	89 12'97"	2534738	727322	UK	69.3	7.02	-102.00	26.2	103.5	0.09		
539	2002/2/3	SS-AP-03-244	22 54'31"	89 12'96"	2534730	727306	UK								Unused
540	2002/2/3	SS-AP-03-245	22 54'39"	89 12'95"	2534879	727280	UK	75.4	7.13	-98.00	26.9	107.0	0.08		
541	2002/2/3	SS-AP-03-246	22 54'41"	89 12'93"	2534908	727235	UK								Unused
542	2002/2/3	SS-AP-03-247	22 54'38"	89 12'96"	2534878	727291	UK								Unused
543	2002/2/3	SS-AP-03-248	22 54'40"	89 12'96"	2534896	727293	UK								Unused
544	2002/2/3	SS-AP-03-249	22 54'41"	89 12'91"	2534916	727208	UK								Unused
545	2002/2/3	SS-AP-03-250	22 54'38"	89 12'97"	2534873	727291	103.6	97.2	7.19	-107.00	27.0	97.9	0.10	0.15	
546	2002/2/3	SS-AP-03-251	22 54'43"	89 12'95"	2535962	727281	UK								Unused
547	2002/2/3	SS-AP-03-252	22 54'46"	89 12'93"	2535006	727246	73.2	73.6	7.15	-118.00	26.4	87.4	0.09		
548	2002/2/3	SS-AP-03-253	22 54'44"	89 12'92"	2534970	727227	UK	89.8	7.14	-96.00	26.3	109.4	0.10		
549	2002/3/3	SS-AP-03-254	22 54'41"	89 12'91"	2534934	727211	UK								Unused
550	2002/3/3	SS-AP-03-255	22 54'40"	89 12'91"	2534910	727213	UK	88.3	7.11	-89.00	27.0	115.9	0.10		
551	2002/3/3	SS-AP-03-256	22 54'38"	89 12'97"	2534855	727321	UK	86.2	7.12	-109.00	27.1	95.9	0.09		
552	2002/3/3	SS-AP-03-257	22 54'39"	89 13'04"	2534876	727440	UK								Unused
553	2002/3/3	SS-AP-03-258	22 54'41"	89 14'90"	2534922	727183	UK	83.6	7.01	-92.00	25.6	113.9	0.20		
554	2002/3/3	SS-AP-03-259	22 54'42"	89 12'89"	2534930	727169	UK	89.2	7.04	-97.00	25.2	109.2	0.10		
555	2002/3/3	SS-AP-03-260	22 54'41"	89 12'87"	2534920	727147	UK	76.4	7.10	-105.00	25.4	101.1	0.20	0.28	
556	2002/3/3	SS-AP-03-261	22 54'44"	89 12'88"	2534962	727156	UK	92.2	7.02	-109.00	25.2	97.2	0.10		
557	2002/3/3	SS-AP-03-262	22 54'44"	89 12'88"	2534975	727163	UK	84.7	7.13	-112.00	25.0	94.4	0.20		
558	2002/3/3	SS-AP-03-263	22 54'44"	89 12'88"	2534975	727162	UK	103.0	7.08	-114.00	25.6	91.9	0.10		
559	2002/3/3	SS-AP-03-264	22 54'45"	89 12'89"	2534981	727174	UK	84.7	7.13	-112.00	25.0	94.4	0.20		
560	2002/3/3	SS-AP-03-265	22 54'44"	89 12'89"	2534973	727181	UK	97.4	7.10	-113.00	25.5	93.0	0.09		
561	2002/3/3	SS-AP-03-266	22 54'45"	89 12'87"	2534984	727137	UK	83.6	7.01	-97.00	25.6	108.9	0.20		
562	2002/3/3	SS-AP-03-267	22 54'45"	89 12'87"	2534988	727137	UK	86.4	7.12	-91.00	24.9	115.4	0.20		
563	2002/3/3	SS-AP-03-268	22 54'47"	89 12'88"	2535015	727151	UK	113.7	7.06	-103.00	25.6	102.9	0.10		
564	2002/3/3	SS-AP-03-269	22 54'47"	89 12'88"	2535022	727154	UK	77.1	7.10	-128.00	25.6	77.9	0.20		
565	2002/3/3	SS-AP-03-270	22 54'47"	89 12'88"	2535020	727153	74.7	86.2	7.12	-107.00	25.5	99.0	0.20	0.15	
566	2002/3/3	SS-AP-03-271	22 54'45"	89 12'86"	2534997	727129	33.5	91.4	7.07	-103.00	25.4	103.1	0.30		
567	2002/3/3	SS-AP-03-272	22 54'42"	89 12'84"	2534971	727086	48.8	118.0	6.98	-113.00	25.4	93.1	0.10		
568	2002/3/3	SS-AP-03-273	22 54'43"	89 12'85"	2534950	727109	UK	89.2	7.04	-97.00	25.3	109.2	0.10		
569	2002/3/3	SS-AP-03-274	22 54'44"	89 12'85"	2534927	727114	54.9	77.6	7.13	-101.00	25.9	104.7	0.10		
570	2002/3/3	SS-AP-03-275	22 54'42"	89 12'88"	2534932	727155	18.3	99.3	7.07	-105.00	25.3	101.2	0.20		
571	2002/3/3	SS-AP-03-276	22 54'41"	89 12'87"	2534920	727138	UK	72.8	7.13	-94.00	24.8	112.5	0.20		
572	2002/3/3	SS-AP-03-277	22 54'41"	89 12'88"	2534920	727155	48.8	88.2	6.98	-80.00	24.7	126.6	0.10		
573	2002/3/3	SS-AP-03-278	22 54'41"	89 12'89"	2534917	727176	UK	117.2	7.09	-118.00	25.7	87.9	0.09		
574	2002/3/3	SS-AP-03-279	22 54'43"	89 12'90"	2534947	727178	16.8	164.0	7.02	-94.00	24.7	112.6	0.20		
575	2002/3/3	SS-AP-03-280	22 54'45"	89 12'96"	2534990	727293	48.8	84.2	7.12	-105.00	25.6	100.9	0.08		
576	2002/3/3	SS-AP-03-281	22 54'44"	89 12'97"	2534981	727315	UK								Unused

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
577	2002/2/17	SS-AP-04-01	22 52'29"	89 15'21"	2531425	731443	UK	58.5	7.02	-61	25.6	144.9	0.07		
578	2002/2/17	SS-AP-04-02	22 52'28"	89 15'23"	2531384	731499	UK	79.3	7.52	-64	25.3	142.2	0.01	0.076	
579	2002/2/17	SS-AP-04-03	22 52'28"	89 15'23"	2531389	731491	UK	76.5	7.04	-62	25.1	144.3	0.03	0.030	
580	2002/2/17	SS-AP-04-04	22 52'27"	89 15'23"	2531369	731482	39.6	76.5	7.03	-68	25.1	138.3	0.01	0.14	
581	2002/2/17	SS-AP-04-05	22 52'29"	89 15'23"	2531430	731477	33.5	72.0	7.00	-64	25.7	141.9	0.20		
582	2002/2/17	SS-AP-04-06	22 52'30"	89 15'21"	2531462	731442	42.7	69.1	7.03	-89	25.6	116.9	0.07		
583	2002/2/17	SS-AP-04-07	22 52'30"	89 15'21"	2531463	731425	33.5	82.7	7.04	-83	25.7	122.9	0.10		
584	2002/2/17	SS-AP-04-08	22 52'30"	89 15'21"	2531445	731438	64.0	97.3	7.41	-92	26.0	113.6	0.08		
585	2002/2/17	SS-AP-04-09	22 52'39"	89 15'25"	2531729	731537	UK	92.2	6.80	-97	25.6	108.9	0.08		
586	2002/2/17	SS-AP-04-10	22 52'40"	89 15'25"	2531755	731560	51.8	88.2	7.01	-91	25.9	114.7	0.07	0.053	
587	2002/2/17	SS-AP-04-11	22 52'40"	89 15'25"	2531771	731554	UK	97.4	7.01	-97	25.2	109.2	0.04	0.0079	
588	2002/2/17	SS-AP-04-12	22 52'41"	89 15'27"	2531783	731601	59.4	94.3	7.10	-93	25.2	113.2	0.07		
589	2002/2/17	SS-AP-04-13	22 52'41"	89 15'26"	2531799	731569	UK								Unused
590	2002/2/17	SS-AP-04-14	22 52'42"	89 15'28"	2531826	731637	58.8	73.3	6.90	-78	25.3	128.2	0.40		
591	2002/2/17	SS-AP-04-15	22 52'44"	89 15'26"	2531873	731565	47.2	74.1	6.80	-79	25.2	127.2	0.06		
592	2002/2/17	SS-AP-04-16	22 52'44"	89 15'25"	2531879	731557	47.2	97.0	6.78	-69	24.6	137.7	0.04	0.039	
593	2002/2/17	SS-AP-04-17	22 52'42"	89 15'24"	2531826	731521	70.1	87.5	6.85	-81	25.2	125.2	0.07		
594	2002/2/17	SS-AP-04-18	22 52'44"	89 15'23"	2531887	731498	42.7	98.3	6.80	-71	25.4	135.1	0.04	0.054	
595	2002/2/17	SS-AP-04-19	22 52'44"	89 15'24"	2531880	731507	42.7	93.1	6.82	-87	25.3	119.2	0.04	0.027	
596	2002/2/17	SS-AP-04-20	22 52'44"	89 15'24"	2531886	731517	UK	90.6	6.89	-77	25.2	129.2	0.07	0.038	
597	2002/2/17	SS-AP-04-21	22 52'45"	89 15'24"	2531915	731507	44.2	77.3	6.82	-82	25.4	124.1	0.06		
598	2002/2/17	SS-AP-04-22	22 52'47"	89 15'23"	2531967	731490	UK	91.3	6.93	-73	25.0	133.4	0.10		
599	2002/2/17	SS-AP-04-23	22 52'47"	89 15'23"	2531959	731484	33.5	81.2	6.93	-69	25.3	137.2	0.20		
600	2002/2/17	SS-AP-04-24	22 52'46"	89 15'24"	2531958	731515	50.3	100.7	6.98	-79	25.1	127.3	0.20		
601	2002/2/17	SS-AP-04-25	22 52'46"	89 15'25"	2531955	731533	UK	91.0	6.95	-89	25.1	117.3	0.08		
602	2002/2/17	SS-AP-04-26	22 52'48"	89 15'24"	2531996	731508	UK	88.3	6.95	-81	25.3	125.2	0.08		
603	2002/2/17	SS-AP-04-27	22 52'48"	89 15'22"	2532022	731446	UK	96.3	7.00	-103	24.9	103.4	0.08		
604	2002/2/17	SS-AP-04-28	22 52'47"	89 15'22"	2531989	731451	UK	116.8	6.86	-90	25.3	116.2	0.20		
605	2002/2/17	SS-AP-04-29	22 52'47"	89 15'21"	2531980	731440	UK	116.3	6.89	-98	25.3	108.2	0.40		
606	2002/2/18	SS-AP-04-30	22 52'49"	89 15'20"	2532024	731409	33.5	105.9	7.07	-91	25.3	115.2	0.02	0.027	
607	2002/2/18	SS-AP-04-31	22 52'49"	89 15'19"	2532039	731378	UK	106.3	6.86	-79	25.3	127.2	0.01	0.079	
608	2002/2/18	SS-AP-04-32	22 52'48"	89 15'19"	2531992	731359	51.8	93.5	6.91	-69	25.4	137.1	0.02	0.031	
609	2002/2/18	SS-AP-04-33	22 52'49"	89 15'17"	2532029	731309	50.3	94.5	6.84	-72	25.1	134.3	0.02		
610	2002/2/18	SS-AP-04-34	22 52'48"	89 15'09"	2531998	731085	UK	113.2	6.90	-81	25.1	125.3	0.30		
611	2002/2/18	SS-AP-04-35	22 52'49"	89 15'10"	2532021	731105	UK	103.3	6.91	-74	25.3	132.2	0.30		
612	2002/2/18	SS-AP-04-36	22 52'48"	89 15'09"	2531988	731089	73.2	111.3	6.89	-94	25.2	112.2	0.40		
613	2002/2/18	SS-AP-04-37	22 52'50"	89 15'14"	2532099	731219	47.2	91.3	6.74	-81	25.2	125.2	0.30		
614	2002/2/18	SS-AP-04-38	22 52'52"	89 15'11"	2532123	731131	52.4	118.3	6.88	-87	24.8	119.5	0.07		
615	2002/2/18	SS-AP-04-39	22 52'54"	89 15'08"	2532183	731055	30.5	71.2	6.87	-63	25.5	143.0	0.06		
616	2002/2/18	SS-AP-04-40	22 52'52"	89 15'10"	2532118	731102	UK	93.1	6.89	-81	24.6	125.7	0.08	0.14	
617	2002/2/18	SS-AP-04-41	22 52'49"	89 15'07"	2532029	731014	38.1	74.3	6.91	-69	25.3	137.2	0.20		
618	2002/2/18	SS-AP-04-42	22 52'48"	89 15'05"	2532010	730968	UK	107.9	6.95	-84	25.4	122.1	0.20		
619	2002/2/27	SS-AP-04-43	22 52'52"	89 15'04"	2532118	730937	38.1	164.2	6.90	-84	25.1	122.3	0.30		
620	2002/2/27	SS-AP-04-44	22 52'53"	89 15'04"	2532161	730938	47.2	159.4	6.86	-49	25.0	157.4	0.30		
621	2002/2/27	SS-AP-04-45	22 52'54"	89 15'03"	2532179	730903	48.8	153.1	6.89	-74	24.9	132.4	0.30		
622	2002/2/27	SS-AP-04-46	22 52'48"	89 15'01"	2532003	730860	35.1	101.3	6.90	-61	24.2	145.9	0.40		
623	2002/2/27	SS-AP-04-47	22 52'43"	89 15'03"	2531831	730920	49.4	148.3	6.97	-83	25.3	123.2	0.30		
624	2002/2/27	SS-AP-04-48	22 52'42"	89 15'02"	2531807	730899	56.4	93.3	6.97	-78	25.5	128.0	0.50		
625	2002/2/27	SS-AP-04-49	22 52'40"	89 15'03"	2531762	730907	54.9	82.3	6.77	-89	25.4	117.1	0.30		
626	2002/2/27	SS-AP-04-50	22 52'41"	89 15'03"	2531771	730924	51.8	84.3	6.93	-93	25.7	112.9	0.30	0.11	
627	2002/2/27	SS-AP-04-51	22 52'41"	89 15'05"	2531773	730978	51.8	91.1	6.83	-78	25.6	127.9	0.20		
628	2002/2/27	SS-AP-04-52	22 52'40"	89 15'03"	2531739	730929	UK	98.2	6.91	-69	25.2	137.2	0.20		
629	2002/2/27	SS-AP-04-53	22 52'41"	89 15'06"	2531782	730993	67.1	106.6	6.71	-78	25.9	127.7	0.50		
630	2002/2/27	SS-AP-04-54	22 52'38"	89 15'04"	2531689	730949	UK	71.3	6.83	-69	25.6	136.9	0.20		
631	2002/2/27	SS-AP-04-55	22 52'39"	89 15'01"	2531727	730852	UK	80.5	6.92	-71	25.6	134.9	0.20		
632	2002/2/27	SS-AP-04-56	22 52'39"	89 15'01"	2531713	730862	52.4	74.3	6.84	-81	25.4	125.1	0.30		
633	2002/2/27	SS-AP-04-57	22 52'38"	89 15'01"	2531702	730853	52.4	72.5	6.81	-69	25.3	137.2	0.30		
634	2002/2/27	SS-AP-04-58	22 52'37"	89 15'02"	2531672	730885	56.4	74.3	6.74	-93	25.5	113.0	0.20		
635	2002/2/27	SS-AP-04-59	22 52'36"	89 15'02"	2531642	730879	51.8	127.4	6.78	-87	25.4	119.1	0.30		
636	2002/2/27	SS-AP-04-60	22 52'37"	89 15'02"	2531622	730884	51.8	130.4	6.87	-89	25.6	116.9	0.30	0.18	
637	2002/2/27	SS-AP-04-61	22 52'34"	89 15'02"	2531577	730896	47.2	109.3	7.03	-71	25.5	135.0	0.40		
638	2002/2/27	SS-AP-04-62	22 52'35"	89 15'04"	2531590	730951	47.2	98.3	6.87	-78	25.2	128.2	0.40		
639	2002/2/27	SS-AP-04-63	22 52'34"	89 15'04"	2531555	730958	56.4	113.3	6.76	-81	25.5	125.0	0.40		
640	2002/2/27	SS-AP-04-64	22 52'35"	89 15'05"	2531597	730981	42.7	96.1	6.88	-87	24.3	119.9	0.30		
641	2002/2/27	SS-AP-04-65	22 52'35"	89 15'06"	2531619	731007	42.7	99.2	6.76	-81	25.1	125.3	0.50		
642	2002/2/28	SS-AP-04-66	22 52'43"	89 14'55"	2531829	730689	47.2	108.2	6.72	-91	26.0	114.6	0.10		
643	2002/2/28	SS-AP-04-67	22 52'42"	89 14'56"	2531826	730718	47.2	103.2	6.75	-84	25.6	121.9	0.20		
644	2002/2/28	SS-AP-04-68	22 52'43"	89 14'56"	2531841	730723	51.8	94.3	6.81	-79	25.3	127.2	0.30		
645	2002/2/28	SS-AP-04-69	22 52'41"	89 14'59"	2531798	730813	51.8	99.3	6.97	-71	25.8	134.8	0.10		
646	2002/2/28	SS-AP-04-70	22 52'45"	89 14'53"	2531897	730632	UK	116.3	6.93	-73	25.8	132.8	0.30	0.22	
647	2002/2/28	SS-AP-04-71	22 52'47"	89 14'53"	2531955	730646	51.8	119.6	6.88	-80	25.9	125.7	0.30		
648	2002/2/28	SS-AP-04-72	22 52'49"	89 14'55"	2532019	730666	UK	133.4	6.81	-87	25.6	118.9	0.20		
649	2002/2/28	SS-AP-04-73	22 52'49"	89 14'56"	2532036	730717	54.9	133.6	6.74	-87	25.7	118.9	0.40		
650	2002/2/28	SS-AP-04-74	22 52'52"	89 14'56"	2532107	730715	48.8	144.0	6.96	-108	25.6	97.9	0.70		
651	2002/2/28	SS-AP-04-75	22 52'50"	89 14'55"	2532056	730679	42.7	144.0	6.96	-108	25.6	97.9	0.70		
652	2002/2/28	SS-AP-04-76	22 52'52"	89 14'58"	2532114	730675	47.2	144.7	6.97	-89	25.5	117.0	0.50		
653	2002/2/28	SS-AP-04-77	22 52'54"	89 14'55"	2532166	730682	54.9	74.7	6.91	-93	25.9	112.7	0.30		
654	2002/2/28	SS-AP-04-78	22 52'54"	89 14'54"	2532185	730666	47.2	130.4	7.02	-79	25.6	126.9	0.30		
655	2002/2/28	SS-AP-04-79	22 52'53"	89 14'54"	2532162	730640	35.1								Unused
656	2002/2/28	SS-AP-04-80	22 52'55"	89 14'52"	2532227	730597	61.0	126.8	7.13	-81	25.1	125.3	0.40	0.23	
657	2002/2/28	SS-AP-04-81	22 52'55"	89 14'52"	2532226	730599	54.9	125.0	6.94	-77	25.6	128.9	0.30		
658	2002/2/28	SS-AP-04-82	22 52'54"	89 14'52"	2532178	730612	39.6	128.8	6.95	-72	25.7	133.9	0.30		
659	2002/2/28	SS-AP-04-83	22 52'56"	89 14'52"	2532226	730584	56.4	118.3	6.98	-84	25.8	121.8	0.50		
660	2002/2/28	SS-AP-04-84	22 52'56"	89 14'50"	2532229	730526	57.9	127.4	7.13	-77	26.4	128.4	0.50		
661	2002/2/28	SS-AP-04-85	22 52'56"	89 14'49"	2532230	730512	UK	110.0	7.25	-69	26.2	136.5	0.20		
662	2002/2/28	SS-AP-04-86	22 52'56"	89 14'48"	2532245	730483	UK								Unused
663	2002/2/28	SS-AP-04-87	22 52'58"	89 14'50"	2532290	730518	56.4	114.8	6.98	-73	25.7	132.9	0.30		
664	2002/2/28	SS-AP-04-88	22 52'59"	89 14'50"	2532332	730536	42.7	91.2	6.92	-71	25.3	135.2	0.10		
665	2002/2/28	SS-AP-04-89	22 52'59"	89 14'49"	2532330	730508	57.9	127.6	6.97	-72	25.3	134.2	0.40		
666	2002/2/28	SS-AP-04-90	22 52'59"	89 14'48"	2532321	730477	53.3	124.1	6.98	-79	25.7	126.9	0.50	0.29	
667	2002/2/28	SS-AP-04-91	22 52'15"	89 15'14"	2530986	731253	UK	100.1	7.18	-69	26.1	136.6	0.10		
668	2002/2/28	SS-AP-04-92	22 52'15"	89 15'13"	2530987	731213	310.9	135.1	7.13	-83	25.4	123.1	0.03	0.030	
669	2002/2/28	SS-AP-04-93	22 52'24"	89 15'10"	2530267	731137	56.4	139.1	7.20	-63	26.1	142.6	0.30		
670	2002/2/28	SS-AP-04-94	22 52'24"	89 15'11"	2530271	731164	25.9	121.3	7.15	-67	26.2	138.5	0.10		
671	2002/2/28	SS-AP-04-95	22 52'31"	89 15'08"	2531484	731076	51.8	109.6	6.96	-70	24.7	136.6	0.40		
672	2002/2/28	SS-AP-04-96	22 52'32"	89 15'08"	2531510	731056	56.4	107.6	6.93	-73	25.1	133.3	0.30		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
673	2002/2/28	SS-AP-04-97	22 52'33"	89 15'08"	2531538	731056	47.2	97.3	6.96	-79	26.3	126.4	0.30		
674	2002/2/28	SS-AP-04-98	22 52'33"	89 15'11"	2531530	731160	UK	84.3	6.95	-68	25.0	138.4	0.40		
675	2002/2/28	SS-AP-04-99	22 52'32"	89 15'12"	2531505	731172	50.6								Unused
676	2002/3/28	SS-AP-04-100	22 52'30"	89 15'13"	2531439	731200	47.2	76.1	7.05	-64	26.3	141.4	0.10	0.28	
677	2002/3/28	SS-AP-04-101	22 52'29"	89 15'14"	2531435	731243	51.8	81.2	7.29	-81	25.8	124.8	0.10		
678	2002/3/28	SS-AP-04-102	22 52'30"	89 15'14"	2531457	731244	38.1	82.3	6.90	-69	25.7	136.9	0.09		
679	2002/3/28	SS-AP-04-103	22 52'31"	89 15'15"	2531490	731264	47.2	91.2	7.13	-81	25.1	125.3	0.10		
680	2002/3/28	SS-AP-04-104	22 52'31"	89 15'14"	2531477	731228	42.7	72.3	7.09	-81	25.8	124.8	0.09		
681	2002/1/3	SS-AP-04-105	22 53'34"	89 13'58"	2533398	729023	UK								Unused
682	2002/1/3	SS-AP-04-106	22 53'33"	89 13'57"	2533361	729021	UK	96.7	7.10	-72	25.9	133.7	0.40		
683	2002/1/3	SS-AP-04-107	22 53'42"	89 14'00"	2533628	729091	61.0								Unused
684	2002/1/3	SS-AP-04-108	22 53'44"	89 14'02"	2533690	729142	UK	94.3	7.16	-81	26.9	124.0	0.50		
685	2002/1/3	SS-AP-04-109	22 53'44"	89 14'04"	2533687	729215	42.7	99.9	7.67	-82	26.6	123.2	0.50		
686	2002/1/3	SS-AP-04-110	22 53'45"	89 14'04"	2533715	729204	47.2	71.3	7.92	-65	27.2	139.8	0.30	0.30	
687	2002/1/3	SS-AP-04-111	22 53'44"	89 14'05"	2533689	729225	UK	79.2	7.89	-71	26.2	134.5	0.30		
688	2002/1/3	SS-AP-04-112	22 53'45"	89 14'02"	2533738	729154	61.0	93.5	6.90	-89	26.4	116.4	0.40		
689	2002/1/3	SS-AP-04-113	22 53'46"	89 14'03"	2533745	729189	UK								Unused
690	2002/1/3	SS-AP-04-114	22 53'47"	89 14'04"	2533799	729210	54.9	96.5	6.92	-85	26.2	120.5	0.40		
691	2002/1/3	SS-AP-04-115	22 53'46"	89 14'03"	2533772	729168	UK	74.3	6.92	-81	26.3	124.4	0.40		
692	2002/1/3	SS-AP-04-116	22 53'46"	89 14'01"	2533755	729108	59.4	76.3	7.00	-83	26.4	122.4	0.50		
693	2002/1/3	SS-AP-04-117	22 53'44"	89 14'05"	2533708	729220	56.4	81.3	6.95	-71	26.4	134.4	0.30		
694	2002/1/3	SS-AP-04-118	22 53'48"	89 13'59"	2533822	729070	56.4	96.8	7.14	-82	26.6	123.2	0.50		
695	2002/1/3	SS-AP-04-119	22 53'48"	89 14'01"	2533827	729113	56.4								Unused
696	2002/1/3	SS-AP-04-120	22 53'50"	89 14'01"	2533872	729102	UK	91.4	7.09	-91	26.1	114.6	0.60	0.17	
697	2002/1/3	SS-AP-04-121	22 53'49"	89 14'00"	2533849	729094	36.6	79.1	6.96	-93	26.4	112.4	0.50		
698	2002/1/3	SS-AP-04-122	22 53'48"	89 14'02"	2533825	729139	56.4	97.0	6.94	-84	26.9	121.0	0.50		
699	2002/1/3	SS-AP-04-123	22 53'49"	89 14'02"	2533844	729140	56.4	99.7	7.00	-79	26.4	126.4	0.50		
700	2002/1/3	SS-AP-04-124	22 53'49"	89 14'02"	2533845	729143	56.4	89.1	6.97	-87	26.5	118.3	0.40		
701	2002/1/3	SS-AP-04-125	22 53'50"	89 14'02"	2533886	727155	51.8	99.2	7.07	-72	26.4	133.4	0.60		
702	2002/1/3	SS-AP-04-126	22 53'50"	89 14'02"	2533895	727154	53.3	115.6	7.07	-81	26.5	124.3	0.50		
703	2002/1/3	SS-AP-04-127	22 53'51"	89 14'01"	2533899	727122	51.8	97.7	6.96	-91	26.1	114.6	0.50		
704	2002/1/3	SS-AP-04-128	22 53'43"	89 13'56"	2533674	728976	38.1	93.3	7.97	-87	26.5	118.3	0.50		
705	2002/1/3	SS-AP-04-129	22 53'42"	89 13'56"	2533638	728974	61.0	81.5	7.08	-70	26.6	135.2	0.30		
706	2002/1/3	SS-AP-04-130	22 53'42"	89 13'57"	2533640	728992	UK	89.7	7.02	-82	26.6	123.2	0.40	0.18	
707	2002/1/3	SS-AP-04-131	22 53'43"	89 13'55"	2533667	728950	61.0	9.3	7.10	-89	26.9	116.0	0.50		
708	2002/1/3	SS-AP-04-132	22 53'44"	89 13'54"	2533693	728924	47.2	91.3	6.96	-71	26.5	134.3	0.50		
709	2002/1/3	SS-AP-04-133	22 53'44"	89 13'53"	2533682	728902	54.9	81.2	7.14	-81	26.3	124.4	0.50		
710	2002/1/3	SS-AP-04-134	22 53'49"	89 13'58"	2533636	729046	38.1	71.3	6.97	-73	26.1	132.6	0.50		
711	2002/1/3	SS-AP-04-135	22 53'49"	89 13'57"	2533847	728999	UK	93.3	7.13	-73	26.6	132.2	0.50		
712	2002/1/3	SS-AP-04-136	22 53'48"	89 13'56"	2533827	728975	UK	74.3	7.15	-69	26.3	136.4	0.50		
713	2002/1/3	SS-AP-04-137	22 53'49"	89 13'57"	2533861	729000	56.4	72.1	6.91	-89	26.3	116.4	0.50		
714	2002/1/3	SS-AP-04-138	22 53'50"	89 13'56"	2533862	728968	56.4	86.3	7.10	-72	26.4	133.4	0.60		
715	2002/1/3	SS-AP-04-139	22 53'51"	89 13'56"	2533914	728968	45.7	78.3	7.01	-77	26.3	128.4	0.50		
716	2002/1/3	SS-AP-04-140	22 53'49"	89 13'53"	2533848	728897	42.7	78.3	7.01	-68	26.1	137.6	0.40	0.19	
717	2002/1/3	SS-AP-04-141	22 53'49"	89 13'52"	2533858	728864	47.2	106.2	7.01	-81	26.0	124.6	0.50		
718	2002/1/3	SS-AP-04-142	22 53'50"	89 13'53"	2533875	728893	44.2	74.3	6.97	-71	26.5	134.3	0.40		
719	2002/1/3	SS-AP-04-143	22 53'51"	89 13'53"	2533904	728894	47.2	91.2	6.93	-77	26.3	128.4	0.30		
720	2002/1/3	SS-AP-04-144	22 53'52"	89 13'52"	2533928	728900	47.2	81.2	6.94	-70	26.2	135.5	0.30		
721	2002/1/3	SS-AP-04-145	22 53'51"	89 13'54"	2533923	728927	UK	110.5	6.99	-91	26.2	114.5	0.30		
722	2002/1/3	SS-AP-04-146	22 53'53"	89 13'51"	2533968	728843	UK	81.3	7.09	-71	25.7	134.9	0.40		
723	2002/1/3	SS-AP-04-147	22 53'54"	89 13'51"	2533991	728828	51.8	97.3	7.13	-90	26.1	115.6	0.30		
724	2002/1/3	SS-AP-04-148	22 53'54"	89 13'50"	2533993	728812	UK	83.2	6.97	-73	25.7	132.9	0.30		
725	2002/1/3	SS-AP-04-149	22 53'53"	89 13'48"	2533953	728745	54.9	111.2	6.87	-72	26.0	133.6	0.50		
726	2002/1/3	SS-AP-04-150	22 53'55"	89 13'46"	2534015	728694	UK	111.5	6.77	-72	26.2	133.5	0.40	0.13	
727	2002/1/3	SS-AP-04-151	22 53'55"	89 13'46"	2534035	728688	51.8	109.0	6.94	-78	26.2	127.5	0.40		
728	2002/1/3	SS-AP-04-152	22 53'55"	89 13'45"	2534040	728647	UK	97.3	7.31	-130	26.3	75.4	0.40		
729	2002/1/3	SS-AP-04-153	22 53'54"	89 13'48"	2533995	728642	UK	97.2	7.16	-123	26.3	82.4	0.30		
730	2002/1/3	SS-AP-04-154	22 53'58"	89 13'43"	2534132	728611	UK	107.3	7.20	-189	26.4	16.4	0.40		
731	2002/1/3	SS-AP-04-155	22 53'59"	89 13'42"	2534138	728577	UK	103.2	7.12	-152	26.3	53.4	0.30		
732	2002/1/3	SS-AP-04-156	22 53'59"	89 13'42"	2534153	728573	UK								Unused
733	2002/1/3	SS-AP-04-157	22 54'00"	89 13'42"	2534170	728576	54.9	103.2	7.16	-89	26.3	116.4	0.30		
734	2002/1/3	SS-AP-04-158	22 54'00"	89 13'41"	2534189	728545	51.8	110.3	7.32	-110	25.2	96.2	0.30		
735	2002/1/3	SS-AP-04-159	22 54'00"	89 13'40"	2534166	728513	56.4	99.3	7.12	-147	26.7	58.1	0.30		
736	2002/1/3	SS-AP-04-160	22 53'59"	89 13'40"	2534163	728518	36.6								Unused
737	2002/1/3	SS-AP-04-161	22 53'53"	89 13'41"	2533955	728544	45.7	85.5	7.22	-81	26.3	124.4	0.50	0.29	
738	2002/1/3	SS-AP-04-162	22 53'52"	89 13'42"	2533938	728563	32.0	99.4	7.15	-91	25.9	114.7	0.40		
739	2002/1/3	SS-AP-04-163	22 53'52"	89 13'40"	2533935	728507	45.7	84.5	7.22	-73	27.0	131.9	0.60		
740	2002/4/3	SS-AP-04-164	22 53'50"	89 13'39"	2533873	728477	50.3	65.5	7.25	-89	26.8	116.1	0.40		
741	2002/1/3	SS-AP-04-165	22 53'50"	89 13'38"	2533872	728459	50.3	64.8	7.20	-91	26.7	114.1	0.40		
742	2002/1/3	SS-AP-04-166	22 53'51"	89 13'38"	2533913	728449	50.3								Unused
743	2002/1/3	SS-AP-04-167	22 53'52"	89 13'36"	2533918	728410	45.7	64.8	7.15	-83	25.7	122.9	0.40		
744	2002/1/3	SS-AP-04-168	22 53'52"	89 13'36"	2533934	728393	50.3	54.3	7.22	-71	26.7	134.1	0.40		
745	2002/1/3	SS-AP-04-169	22 53'52"	89 13'36"	2533945	728412	57.9	58.4	7.22	-74	26.1	131.6	0.50		
746	2002/1/3	SS-AP-04-170	22 53'54"	89 13'37"	2534005	728441	50.3								Unused
747	2002/1/3	SS-AP-04-171	22 53'36"	89 13'36"	2534987	728414	51.8	51.2	7.23	-79	26.4	126.4	0.60	0.23	
748	2002/2/3	SS-AP-04-172	22 53'55"	89 13'37"	2534024	728437	50.3	89.4	7.12	-83	26.5	122.3	0.70		
749	2002/2/3	SS-AP-04-173	22 53'56"	89 13'37"	2534058	728427	59.4	92.5	7.42	-85	26.2	120.5	0.40		
750	2002/2/3	SS-AP-04-174	22 53'53"	89 13'35"	2533967	728369	41.1	94.5	7.19	-70	26.6	135.2	0.70		
751	2002/2/3	SS-AP-04-175	22 53'54"	89 13'35"	2533987	728364	50.3	90.5	7.13	-72	26.5	133.3	0.40		
752	2002/2/3	SS-AP-04-176	22 53'54"	89 13'35"	2533998	728372	50.3	90.5	7.13	-72	26.2	133.5	0.20		
753	2002/2/3	SS-AP-04-177	22 53'55"	89 13'35"	2534012	728381	41.1	89.5	7.15	-81	26.4	124.4	0.60		
754	2002/2/3	SS-AP-04-178	22 53'55"	89 13'35"	2534036	728370	50.3	92.5	7.20	-91	26.4	114.4	0.60		
755	2002/2/3	SS-AP-04-179	22 53'56"	89 13'33"	2534068	728323	45.7	85.5	7.09	-69	26.4	136.4	0.60		
756	2002/2/3	SS-AP-04-180	22 53'55"	89 13'33"	2534036	728335	UK	85.5	7.20	-81	25.4	125.1	0.40	0.34	
757	2002/2/3	SS-AP-04-181	22 53'56"	89 13'32"	2534066	728293	45.7	69.4	7.20	-72	26.3	133.4	0.40		
758	2002/2/3	SS-AP-04-182	22 53'56"	89 13'32"	2534042	728396	50.3	85.5	7.02	-81	26.6	124.2	0.40		
759	2002/2/3	SS-AP-04-183	22 53'56"	89 13'33"	2534040	728305	50.3	81.5	7.06	-87	26.3	118.4	0.50		
760	2002/2/3	SS-AP-04-184	22 53'55"	89 13'33"	2534028	728304	48.8	69.5	7.15	-89	26.6	116.2	0.40		
761	2002/2/3	SS-AP-04-185	22 53'58"	89 13'36"	2534020	728406	50.3	95.5	7.14	-83	26.0	122.6	0.70		
762	2002/2/3	SS-AP-04-186	22 53'59"	89 13'37"	2534146	728523	50.3	84.5	7.14	-92	26.0	113.6	0.60		
763	2002/2/3	SS-AP-04-187	22 54'00"	89 13'37"	2534185	728425	51.8	127.5	7.01	-81	25.9	124.7	0.50		
764	2002/2/3	SS-AP-04-188	22 54'01"	89 13'36"	2534197	728446	504.1	102.5	7.20	-93	26.0	112.6	0.70		
765	2002/2/3	SS-AP-04-189	22 54'01"	89 13'38"	2534207	728459	41.1	97.5	7.12	-72	25.7	133.9	0.60		
766	2002/2/3	SS-AP-04-190	22 54'01"	89 13'38"	2534220	728466	50.3	93.4	7.13	-82	26.1	123.6	0.40	0.25	
767	2002/2/3	SS-AP-04-191	22 54'02"	89 13'36"	2534225	728469	41.1	102.3	7.13	-91	26.3	114.4	0.50		
768	2002/2/3	SS-AP-04-192	22 54'02"	89 13'35"	2534245	728377	51.8	97.5	7.03	-68	26.1	137.6	0.50		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
769	2002/2/3	SS-AP-04-193	22 54'02"	89 13'36"	2534252	728389	57.9	102.3	7.19	-69	26.2	136.5	0.60		
770	2002/2/3	SS-AP-04-194	22 54'02"	89 13'36"	2534251	728405	54.9	101.2	7.02	-81	26.7	124.1	0.60		
771	2002/2/3	SS-AP-04-195	22 54'04"	89 13'35"	2534307	728360	67.1	113.2	7.03	-79	26.3	126.4	0.50		
772	2002/2/3	SS-AP-04-196	22 54'04"	89 13'35"	2534312	728363	67.1	101.2	7.09	-82	26.3	123.4	0.50		
773	2002/2/3	SS-AP-04-197	22 54'05"	89 13'33"	2534316	728325	54.9	106.3	7.08	-83	26.3	122.4	0.60		
774	2002/2/3	SS-AP-04-198	22 54'04"	89 13'32"	2534307	728205	67.1	65.3	7.20	-78	25.9	127.7	0.50		
775	2002/2/3	SS-AP-04-199	22 54'05"	89 13'30"	2534315	728226	57.9	65.5	7.03	-71	25.6	134.9	0.50		
776	2002/2/3	SS-AP-04-200	22 54'04"	89 13'29"	2534303	728190	54.9	99.5	7.20	-81	25.6	124.9	0.40	0.13	
777	2002/2/3	SS-AP-04-201	22 54'05"	89 13'28"	2534334	728174	48.8	90.6	7.79	-71	25.9	134.7	0.60		
778	2002/2/3	SS-AP-04-202	22 54'04"	89 13'28"	2534386	728179	48.8	90.6	7.79	-71	25.9	134.7	0.60		
779	2002/2/3	SS-AP-04-203	22 54'03"	89 13'27"	2534260	728156	50.3	95.0	7.11	-81	26.0	124.6	0.50		
780	2002/2/3	SS-AP-04-204	22 54'02"	89 13'27"	2534241	728153	70.1	96.1	7.12	-81	26.0	124.6	0.50		
781	2002/2/3	SS-AP-04-205	22 54'02"	89 13'27"	2534227	728143	51.8	88.5	7.03	-89	26.1	116.6	0.50		
782	2002/2/3	SS-AP-04-206	22 54'01"	89 13'27"	2534195	728147	67.1	87.7	7.19	-71	25.6	134.9	0.60		
783	2002/2/3	SS-AP-04-207	22 54'00"	89 13'28"	2534170	728179	54.9	99.1	7.18	-93	26.5	112.3	0.60		
784	2002/2/3	SS-AP-04-208	22 54'07"	89 13'30"	2534379	728222	45.7	98.8	7.09	-81	26.5	124.3	0.40		
785	2002/2/3	SS-AP-04-209	22 54'07"	89 13'31"	2534393	728246	45.7	95.5	7.13	-70	26.5	135.3	0.50		
786	2002/2/3	SS-AP-04-210	22 54'07"	89 13'29"	2534380	728193	50.3	81.5	7.10	-83	26.1	122.6	0.40	0.22	
787	2002/2/3	SS-AP-04-211	22 54'07"	89 13'29"	2534393	728183	50.3	78.2	7.12	-72	25.8	133.8	0.40		
788	2002/3/28	SS-AP-04-212	22 52'57"	89 15'07"	2531366	731042	47.2	104.3	7.08	-71	26.5	134.3	0.20		
789	2002/3/28	SS-AP-04-213	22 54'08"	89 13'27"	2534435	738154	UK	91.3	7.09	-80	25.9	125.7	0.30		
790	2002/3/28	SS-AP-04-214	22 54'10"	89 13'28"	2534487	738169	57.9	91.3	7.03	-81	25.9	124.7	0.30		
791	2002/3/28	SS-AP-04-215	22 54'10"	89 13'26"	2534470	738111	UK	87.2	7.13	-71	25.7	134.9	0.40		
792	2002/3/28	SS-AP-04-216	22 54'10"	89 13'26"	2534495	738108	47.2	78.2	7.04	-72	26.3	133.4	0.30		
793	2002/3/28	SS-AP-04-217	22 54'11"	89 13'26"	2534512	738115	51.8	79.3	7.19	-89	26.1	116.6	0.40		
794	2002/3/28	SS-AP-04-218	22 54'11"	89 13'26"	2534520	738123	57.9	101.2	7.03	-69	25.9	136.7	0.30		
795	2002/3/28	SS-AP-04-219	22 54'12"	89 13'25"	2534541	738084	39.6	102.3	7.13	-101	26.3	104.4	0.30		
796	2002/3/28	SS-AP-04-220	22 54'12"	89 13'26"	2534557	738112	45.7	109.3	7.14	-101	26.1	104.6	0.40	0.26	
797	2002/3/28	SS-AP-04-221	22 54'12"	89 13'26"	2534552	738102	51.8	107.2	7.12	-89	26.5	116.3	0.30		
798	2002/3/28	SS-AP-04-222	22 54'11"	89 13'25"	2534525	738089	UK								Unused
799	2002/3/28	SS-AP-04-223	22 54'11"	89 13'25"	2534503	738083	47.2	89.1	6.98	-97	26.7	108.1	0.30		
800	2002/3/28	SS-AP-04-224	22 54'09"	89 13'25"	2534438	738087	UK	82.1	7.06	-87	26.7	118.1	0.30		
801	2002/3/28	SS-AP-04-225	22 54'09"	89 13'25"	2534446	738076	UK	89.1	7.02	-83	26.1	122.6	0.30		
802	2002/3/28	SS-AP-04-226	22 54'08"	89 13'25"	2534405	738082	51.8	78.1	6.99	-83	26.3	122.4	0.30		
803	2002/3/28	SS-AP-04-227	22 54'07"	89 13'24"	2534389	738058	UK	98.2	7.21	-79	26.0	126.6	0.30		
804	2002/3/28	SS-AP-04-228	22 54'06"	89 13'23"	2534364	738038	47.2	102.2	7.02	-72	25.7	133.9	0.30		
805	2002/3/28	SS-AP-04-229	22 54'07"	89 13'23"	2534375	738030	56.4	10.3.2	7.09	-83	26.4	122.4	0.40		
806	2002/3/28	SS-AP-04-230	22 54'08"	89 13'28"	2534407	738016	UK	104.1	7.02	-94	26.1	111.6	0.30	0.20	
807	2002/3/28	SS-AP-04-231	22 54'08"	89 13'22"	2534424	737990	UK	102.3	7.12	-71	25.7	134.9	0.30		
808	2002/3/28	SS-AP-04-232	22 54'09"	89 13'21"	2534441	737960	57.9	109.3	7.14	-77	25.8	128.8	0.20		
809	2002/3/28	SS-AP-04-233	22 54'10"	89 13'21"	2534462	737966	38.1	107.4	7.14	-84	25.3	122.2	0.30		
810	2002/3/28	SS-AP-04-234	22 54'08"	89 13'20"	2534416	737945	UK	79.4	7.12	-83	25.9	122.7	0.30		
811	2002/3/28	SS-AP-04-235	22 54'08"	89 13'21"	2534408	737967	UK	81.2	7.17	-69	25.1	137.3	0.30		
812	2002/3/28	SS-AP-04-236	22 54'07"	89 13'21"	2534387	737970	47.2	91.2	7.15	-81	26.2	124.5	0.20		
813	2002/3/28	SS-AP-04-237	22 54'05"	89 13'20"	2534334	737954	47.2	81.2	7.21	-71	26.2	134.5	0.30		
814	2002/3/28	SS-AP-04-238	22 54'04"	89 13'22"	2534290	737989	51.8	91.2	7.14	-81	26.2	124.5	0.20		
815	2002/3/28	SS-AP-04-239	22 54'03"	89 13'21"	2534276	737979	57.9	92.1	7.09	-71	25.4	135.1	0.20		
816	2002/3/28	SS-AP-04-240	22 54'03"	89 13'22"	2534265	737998	54.9	92.1	7.21	-67	25.7	138.9	0.30	0.18	
817	2002/3/28	SS-AP-04-241	22 54'03"	89 13'23"	2534237	738024	UK	105.3	7.13	-68	25.9	137.7	0.20		
818	2002/2/28	SS-AP-05-01	22 53'02"	89 14'37"	2532416	730175	56.4	106.9	7.02	-109	25.6	96.9	0.60		
819	2002/2/28	SS-AP-05-02	22 53'03"	89 14'37"	2532455	730172	32.0	95.8	6.98	-105	25.7	100.9	0.30		
820	2002/2/28	SS-AP-05-03	22 53'03"	89 14'38"	2532460	730200	50.3	112.2	7.00	-111	25.3	95.2	0.60		
821	2002/2/28	SS-AP-05-04	22 53'05"	89 14'42"	2532500	730300	45.7	136.1	7.09	-120	25.2	86.2	0.50		
822	2002/2/28	SS-AP-05-05	22 53'04"	89 14'43"	2532490	730347	45.7	145.5	7.02	-122	25.3	84.2	0.50		
823	2002/2/28	SS-AP-05-06	22 53'03"	89 14'47"	2532457	730344	41.1	132.5	7.20	-119	25.8	86.8	0.40		
824	2002/2/28	SS-AP-05-07	22 53'02"	89 14'46"	2532411	730427	45.7	139.5	7.01	-118	26.3	87.4	0.50		
825	2002/2/28	SS-AP-05-08	22 53'01"	89 14'46"	2532398	730423	50.3	136.1	7.22	-122	25.4	84.1	0.60		
826	2002/2/28	SS-AP-05-09	22 53'01"	89 14'46"	2532380	730438	45.7	108.8	6.90	-117	25.3	89.2	0.08		
827	2002/2/28	SS-AP-05-10	22 52'59"	89 14'46"	2532334	730428	27.4	109.5	6.89	-120	25.9	85.7	0.04	0.065	
828	2002/2/28	SS-AP-05-11	22 53'04"	89 14'38"	2532495	730183	48.8	122.0	6.89	-110	25.8	95.8	0.10		
829	2002/2/28	SS-AP-05-12	22 53'09"	89 14'39"	2532438	730229	45.7	139.9	7.08	-120	25.2	86.2	0.60		
830	2002/2/28	SS-AP-05-13	22 53'09"	89 14'40"	2532648	730263	41.1	140.0	7.01	-120	25.4	86.1	0.40		
831	2002/2/28	SS-AP-05-14	22 53'11"	89 14'44"	2532690	730352	41.1	155.5	7.25	-120	25.4	86.1	0.50		
832	2002/2/28	SS-AP-05-15	22 53'11"	89 14'45"	2532713	730388	30.5	154.3	7.20	-115	25.5	91.0	0.30		
833	2002/2/28	SS-AP-05-16	22 53'12"	89 14'44"	2532726	730373	41.1	154.8	7.20	-119	25.3	87.2	0.50		
834	2002/2/28	SS-AP-05-17	22 53'15"	89 14'41"	2532832	730275	50.3	145.0	7.12	-132	25.6	73.9	0.40		
835	2002/2/28	SS-AP-05-18	22 53'16"	89 14'40"	2532848	730232	45.7	140.5	7.18	-127	25.0	79.4	0.50		
836	2002/2/28	SS-AP-05-19	22 53'14"	89 14'40"	2532800	730250	45.7	142.5	7.21	-130	25.6	75.9	0.60		
837	2002/2/28	SS-AP-05-20	22 53'14"	89 14'40"	2532787	730242	45.7	135.5	7.20	-136	25.3	70.2	0.70		
838	2002/2/28	SS-AP-05-21	22 53'15"	89 14'39"	2532807	730205	45.7	145.7	7.16	-121	25.7	84.9	0.50		
839	2002/2/28	SS-AP-05-22	22 53'13"	89 14'38"	2532761	730176	30.5	132.5	7.09	-122	25.5	84.0	0.40		
840	2002/2/28	SS-AP-05-23	22 53'17"	89 14'42"	2532892	730287	45.7	149.5	7.14	-133	25.2	73.2	0.40		
841	2002/2/28	SS-AP-05-24	22 53'19"	89 14'39"	2532949	730224	45.7	135.2	7.14	-131	25.3	75.2	0.30		
842	2002/2/28	SS-AP-05-25	22 53'20"	89 14'38"	2532965	730201	45.7	133.5	7.20	-130	25.2	76.2	0.20		
843	2002/2/28	SS-AP-05-26	22 53'22"	89 14'40"	2533043	730229	50.3	140.5	7.10	-122	25.4	84.1	0.50		
844	2002/2/28	SS-AP-05-27	22 53'23"	89 14'40"	2533060	730232	45.7								Unused
845	2002/2/28	SS-AP-05-28	22 53'24"	89 14'38"	2533102	730182	50.3	139.5	7.19	-123	25.3	83.2	0.60		
846	2002/2/28	SS-AP-05-29	22 53'25"	89 14'38"	2533133	730190	45.7	139.9	7.22	-128	25.6	77.9	0.50		
847	2002/2/28	SS-AP-05-30	22 53'28"	89 14'38"	2533215	730194	45.7	139.7	7.34	-119	25.4	87.1	0.60	0.41	
848	2002/2/28	SS-AP-05-31	22 53'29"	89 14'39"	2533259	730210	45.7	139.9	7.13	-125	25.3	81.2	0.60		
849	2002/2/28	SS-AP-05-32	22 53'29"	89 14'38"	2533244	730688	36.6	138.2	7.13	-129	25.2	77.2	0.20		
850	2002/2/28	SS-AP-05-33	22 53'28"	89 14'36"	2533207	730132	50.3	138.0	7.24	-118	25.1	88.3	0.50		
851	2002/2/28	SS-AP-05-34	22 53'28"	89 14'36"	2533223	730127	53.3	136.5	7.12	-128	25.2	78.2	0.50		
852	2002/2/28	SS-AP-05-35	22 53'29"	89 14'36"	2533236	730118	51.8	137.5	7.12	-125	25.9	80.7	0.40		
853	2002/2/28	SS-AP-05-36	22 53'29"	89 14'35"	2533244	730103	51.8	139.4	7.10	-126	25.5	80.0	0.70		
854	2002/2/28	SS-AP-05-37	22 53'30"	89 14'35"	2533265	730089	41.1	134.9	7.17	-127	25.6	78.9	0.20		
855	2002/2/28	SS-AP-05-38	22 53'30"	89 14'36"	2533283	730124	50.3	137.2	7.11	-139	25.0	67.4	0.40		
856	2002/2/28	SS-AP-05-39	22 53'27"	89 14'35"	2533288	730099	50.3	136.0	7.11	-129	25.4	77.1	0.50		
857	2002/2/28	SS-AP-05-40	22 53'25"	89 14'35"	2533130	730104	45.7	150.0	7.16	-125	25.5	81.0	0.30	0.29	
858	2002/1/3	SS-AP-05-41	22 53'20"	89 14'32"	2532963	730022	45.7	130.5	7.03	-103.00	26.3	102.4	0.50		
859	2002/1/3	SS-AP-05-42	22 53'19"	89 14'33"	2532937	730053	50.3	125.5	7.15	-110.00	26.1	95.6	0.40		
860	2002/1/3	SS-AP-05-43	22 53'19"	89 14'32"	2532925	730018	50.3	125.5	7.15	-110.00	26.7	95.1	0.40		
861	2002/1/3	SS-AP-05-44	22 53'18"	89 14'32"	2532902	730012	27.4	131.5	7.00	-106.00	26.1	99.6	0.50		
862	2002/1/3	SS-AP-05-45	22 53'18"	89 14'31"	2532924	729993	45.7								Unused
863	2002/1/3	SS-AP-05-46	22 53'15"	89 14'34"	2532815	723071	45.7								Unused
864	2002/1/3	SS-AP-05-47	22 53'14"	89 14'32"	2532801	723009	45.7	130.5	7.20	-123.00	26.3	82.4	0.50		

Table 3.2.8 Results of Screening Survey (Altapol: No.1 to No.911)

No.	Date	Well No.	Coodinates 1				Depth	EC	PH	ORP	Water	Eh	As (FK)	As	Remarks
			Latitude	Longitude	UTM		(m)	(mS/m)		(mV)	Temp	(mV)	(mg/l)	(AAS)	
865	2002/1/3	SS-AP-05-48	22 53'10"	89 14'33"	2532665	723055	41.1	126.3	7.16	-120.00	25.1	86.3	0.50		
866	2002/1/3	SS-AP-05-49	22 53'33"	89 14'35"	2533365	723095	48.8	136.0	7.16	-122.00	25.6	83.9	0.60		
867	2002/1/3	SS-AP-05-50	22 53'33"	89 14'35"	2533386	723073	50.3	137.3	7.19	-130.00	25.7	75.9	0.40	0.19	
868	2002/1/3	SS-AP-05-51	22 53'35"	89 14'35"	2533428	730107	50.3	137.3	7.12	-132.00	26.4	73.4	0.65		
869	2002/1/3	SS-AP-05-52	22 53'35"	89 14'33"	2533424	730047	45.7								Unused
870	2002/1/3	SS-AP-05-53	22 53'35"	89 14'33"	2533418	730027	45.7								Unused
871	2002/1/3	SS-AP-05-54	22 53'36"	89 14'32"	2533459	730006	48.8	134.0	7.11	-122.00	26.0	83.6	0.50		
872	2002/1/3	SS-AP-05-55	22 53'37"	89 14'26"	2533482	729838	45.7	130.5	7.15	-125.00	25.8	80.8	0.60		
873	2002/1/3	SS-AP-05-56	22 53'37"	89 14'26"	2533483	729825	45.7	125.5	7.12	-115.00	26.2	90.5	0.60		
874	2002/1/3	SS-AP-05-57	22 53'37"	89 14'24"	2533488	729775	50.3	128.5	7.12	-115.00	26.2	90.5	0.50		
875	2002/1/3	SS-AP-05-58	22 53'38"	89 14'24"	2533536	729784	45.7	129.5	7.19	-118.00	25.7	87.9	0.40		
876	2002/1/3	SS-AP-05-59	22 53'39"	89 14'23"	2533548	729757	32.0	130.5	7.06	-129.00	25.7	76.9	0.40		
877	2002/1/3	SS-AP-05-60	22 53'37"	89 14'21"	2533499	729701	45.7	130.2	7.10	-120.00	26.4	85.4	0.40	0.29	
878	2002/1/3	SS-AP-05-61	22 53'35"	89 14'21"	2533430	729691	41.1	129.5	7.08	-125.00	25.0	81.4	0.50		
879	2002/1/3	SS-AP-05-62	22 53'35"	89 14'22"	2533440	729722	41.1	125.9	7.11	-121.00	25.1	85.3	0.50		
880	2002/1/3	SS-AP-05-63	22 53'36"	89 14'19"	2533458	729628	41.1	120.5	7.24	-119.00	25.4	87.1	0.60		
881	2002/1/3	SS-AP-05-64	22 53'38"	89 14'20"	2533507	729662	45.7	122.6	7.20	-121.00	25.9	84.7	0.40		
882	2002/1/3	SS-AP-05-65	22 53'39"	89 14'21"	2533538	729700	50.3	125.0	7.17	-101.00	25.4	105.1	0.60		
883	2002/1/3	SS-AP-05-66	22 53'40"	89 14'20"	2533573	729660	41.1	122.5	7.15	-99.00	27.0	105.9	0.40		
884	2002/1/3	SS-AP-05-67	22 53'40"	89 14'21"	2533588	729680	50.3	125.5	7.14	-105.00	26.8	100.1	0.50		
885	2002/1/3	SS-AP-05-68	22 53'41"	89 14'20"	2533607	729660	41.1	135.5	7.03	-109.00	26.5	96.3	0.40		
886	2002/1/3	SS-AP-05-69	22 53'41"	89 14'20"	2533602	729651	50.3	125.9	7.10	-101.00	26.3	104.4	0.30		
887	2002/1/3	SS-AP-05-70	22 53'41"	89 14'19"	2533610	729633	45.7	126.5	7.14	-98.00	26.2	107.5	0.40	0.27	
888	2002/1/3	SS-AP-05-71	22 53'42"	89 14'18"	2533640	729615	51.8	120.5	7.20	-95.00	26.1	110.6	0.40		
889	2002/1/3	SS-AP-05-72	22 53'42"	89 14'17"	2533631	729585	41.1	120.5	7.23	-110.00	26.5	95.3	0.40		
890	2002/1/3	SS-AP-05-73	22 53'40"	89 14'17"	2533587	729577	59.4	129.5	7.10	-101.00	26.5	104.3	0.20		
891	2002/1/3	SS-AP-05-74	22 53'41"	89 14'16"	2533615	729558	59.4	122.9	7.15	-105.00	26.2	100.5	0.30		
892	2002/1/3	SS-AP-05-75	22 53'42"	89 14'17"	2533633	729568	41.1	125.0	7.20	-100.00	25.7	105.9	0.50		
893	2002/1/3	SS-AP-05-76	22 53'42"	89 14'16"	2533656	729553	41.1	119.6	7.14	-101.00	26.3	104.4	0.30		
894	2002/1/3	SS-AP-05-77	22 53'43"	89 14'15"	2533671	729534	41.1	118.0	7.13	-99.00	26.4	106.4	0.30		
895	2002/1/3	SS-AP-05-78	22 53'44"	89 14'13"	2533698	729466	41.1	121.2	7.05	-105.00	26.2	100.5	0.40		
896	2002/1/3	SS-AP-05-79	22 53'44"	89 14'12"	2533706	729423	41.1	112.2	7.12	-101.00	26.2	104.5	0.40		
897	2002/1/3	SS-AP-05-80	22 53'43"	89 14'13"	2533664	729461	45.7	125.5	7.05	-103.00	26.5	102.3	0.40	0.27	
898	2002/2/3	SS-AP-05-81	22 53'42"	89 14'08"	2533623	729332	50.3	122.5	7.02	-135.00	25.2	71.2	0.40		
899	2002/2/3	SS-AP-05-82	22 53'41"	89 14'07"	2533616	729304	45.7	133.2	7.20	-115.00	25.2	91.2	0.50		
900	2002/2/3	SS-AP-05-83	22 53'41"	89 14'07"	2533615	729280	41.1								Unused
901	2002/2/3	SS-AP-05-84	22 53'43"	89 14'08"	2533671	729322	57.9	125.5	7.06	-120.00	25.6	85.9	0.50		
902	2002/2/3	SS-AP-05-85	22 53'44"	89 14'09"	2533700	729343	45.7	110.5	7.05	-111.00	25.9	94.7	0.50		
903	2002/2/3	SS-AP-05-86	22 53'45"	89 14'08"	2533732	729319	41.1	125.2	7.02	-135.00	25.0	71.4	0.30		
904	2002/2/3	SS-AP-05-87	22 53'41"	89 14'05"	2533606	729246	50.3	100.5	7.20	-123.00	26.6	82.2	0.40		
905	2002/2/3	SS-AP-05-88	22 53'41"	89 14'06"	2533605	729278	45.7	101.5	7.08	-124.00	26.4	81.4	0.40		
906	2002/2/3	SS-AP-05-89	22 53'41"	89 14'05"	2533592	729228	50.3	95.5	7.02	-123.00	25.6	82.9	0.30		
907	2002/2/3	SS-AP-05-90	22 53'40"	89 14'04"	2533570	729211	62.5	96.2	7.07	-111.00	25.8	94.8	0.50	0.22	
908	2002/2/3	SS-AP-05-91	22 53'39"	89 14'04"	2533531	729203	45.7	99.5	7.05	-128.00	25.3	78.2	0.40		
909	2002/2/3	SS-AP-05-92	22 53'38"	89 14'03"	2533513	729192	45.7	105.2	7.02	-118.00	25.3	88.2	0.40		
910	2002/2/3	SS-AP-05-93	22 53'38"	89 14'04"	2533501	729197	50.3	119.2	7.12	-114.00	25.4	92.1	0.40		
911	2002/2/3	SS-AP-05-94	22 53'41"	89 14'04"	2533613	729196	41.1	112.2	7.30	-109.00	25.2	97.2	0.40		

Table 3.2.9 Results of Screening Survey (Sarfabad: No.1 to No.50)

No.	Date	Well No.	Coodinates 1				Depth (m	EC (mS/n	PH	ORP (m	Water Temp	Eh (mV)	(FK) (m	AAS) (	Remarks
			Latitude	Longitude	UTM										
1	2002/1/24	SS-SF-03-01	22 52'92"	89 13'78"	2532183	728742	UK	39.6	7.22	-100	25.3	106.2	0.02	0.023	
2	2002/1/24	SS-SF-03-02	22 52'89"	89 13'75"	2532136	728694	38.1	53.1	7.19	-114	25.1	92.3	0.08	0.072	
3	2002/1/24	SS-SF-03-03	22 52'88"	89 13'69"	2532112	728577	35.1	49.0	7.12	-102	25.3	104.2	0.08		
4	2002/1/24	SS-SF-03-04	22 52'86"	89 13'66"	2532078	728531	29.0	57.0	7.12	-105	24.9	101.4	0.02		
5	2002/1/26	SS-SF-03-05	22 52'88"	89 13'66"	2532107	728528	35.1	166.7	7.16	-102	25.2	104.2	0.02		
6	2002/1/26	SS-SF-03-06	22 52'89"	89 13'66"	2532126	728526	UK	136.0	6.92	-67	25.4	139.1	0.06		
7	2002/1/26	SS-SF-03-07	22 52'90"	89 13'67"	2532152	728556	UK	67.4	6.94	-87	25.3	119.2	0.07		
8	2002/1/26	SS-SF-03-08	22 52'86"	89 13'54"	2532081	728497	UK	49.1	6.92	-74	25.3	132.2	0.06		
9	2002/1/26	SS-SF-03-09	22 52'86"	89 13'61"	2532068	728451	UK	76.6	7.05	-106	25.2	100.2	0.07		
10	2002/1/26	SS-SF-03-10	22 52'86"	89 13'59"	2532070	728421	30.5	98.6	7.10	-115	25.2	91.2	0.07	0.18	
11	2002/1/26	SS-SF-03-11	22 52'99"	89 13'71"	2532319	728623	25.9	152.1	6.96	-116	25.6	89.9	0.08		
12	2002/1/26	SS-SF-03-12	22 52'00"	89 13'74"	2532339	728664	UK	73.9	7.11	-116	25.4	90.1	0.07		
13	2002/1/26	SS-SF-03-13	22 53'04"	89 13'76"	2532411	728699	UK	74.4	7.15	-114	25.4	92.1	0.06		
14	2002/1/26	SS-SF-03-14	22 53'09"	89 13'80"	2532483	728774	79.2	55.3	7.18	-120	25.3	86.2	0.20		
15	2002/1/26	SS-SF-03-15	22 53'08"	89 13'78"	2532477	728740	48.8	49.5	7.21	-124	25.8	81.8	0.20		
16	2002/1/26	SS-SF-03-16	22 53'10"	89 13'77"	2532516	728723	41.1	48.6	7.24	-131	25.6	74.9	0.20		
17	2002/1/26	SS-SF-03-17	22 53'11"	89 13'81"	2532539	728776	36.6	47.3	7.26	-122	25.5	84.0	0.09		
18	2002/1/26	SS-SF-03-18	22 53'11"	89 13'80"	2532543	728776	39.6	49.2	7.25	-118	25.9	87.7	0.20		
19	2002/1/27	SS-SF-03-19	22 53'09"	89 13'82"	2532492	728813	39.6	45.6	7.13	-108	25.1	98.3	0.08		
20	2002/1/27	SS-SF-03-20	22 53'11"	89 13'82"	2532547	728813	41.1	54.5	7.10	-126	24.7	80.6	0.07	0.32	
21	2002/1/27	SS-SF-03-21	22 53'10"	89 13'84"	2532518	728831	36.6	56.2	7.12	-129	25.1	77.3	0.07		
22	2002/1/27	SS-SF-03-22	22 53'09"	89 13'86"	2532507	728863	UK	76.8	7.16	-128	24.9	78.4	0.20		
23	2002/1/27	SS-SF-03-23	22 53'09"	89 13'87"	2532501	728897	30.5	53.3	7.16	-134	24.7	72.6	0.20		
24	2002/1/27	SS-SF-03-24	22 53'07"	89 13'89"	2532468	728916	UK	48.4	7.15	-134	24.8	72.5	0.20		
25	2002/1/27	SS-SF-03-25	22 53'08"	89 13'82"	2532481	728810	70.1	45.4	7.23	-127	25.1	79.3	0.10		
26	2002/1/27	SS-SF-03-26	22 53'11"	89 13'81"	2532533	728780	UK	53.6	7.25	-130	24.9	76.4	0.20		
27	2002/1/27	SS-SF-03-27	22 53'11"	89 13'83"	2532544	728823	UK	43.0	7.20	-130	24.6	76.7	0.20		
28	2002/1/27	SS-SF-03-28	22 53'13"	89 13'82"	2532564	728802	36.6	48.8	7.26	-116	25.1	90.3	0.08		
29	2002/1/27	SS-SF-03-29	22 53'11"	89 13'82"	2532533	728805	45.7	45.5	7.28	-126	24.8	80.5	0.07		
30	2002/1/27	SS-SF-03-30	22 53'13"	89 13'80"	2532584	728764	UK	45.8	7.29	-108	25.5	98.0	0.20	0.13	
31	2002/1/27	SS-SF-03-31	22 53'14"	89 13'78"	2532589	728732	UK	45.6	7.30	-125	24.9	81.4	0.10		
32	2002/1/27	SS-SF-03-32	22 53'14"	89 13'81"	2532590	728779	48.8	44.8	7.31	-126	25.8	79.8	0.20		
33	2002/1/27	SS-SF-03-33	22 53'15"	89 13'79"	2532614	728758	41.1	47.6	7.29	-123	24.9	83.4	0.20		
34	2002/1/27	SS-SF-03-34	22 53'15"	89 13'80"	2532616	728769	25.9	49.9	7.28	-128	25.1	78.3	0.20		
35	2002/1/28	SS-SF-03-35	22 53'17"	89 13'87"	2532662	728886	61.0	78.7	6.96	-88	24.6	118.7	0.40		
36	2002/1/28	SS-SF-03-36	22 53'19"	89 13'85"	2532686	728853	54.9	81.6	7.16	-112	24.8	94.5	0.40		
37	2002/1/28	SS-SF-03-37	22 53'18"	89 13'79"	2532677	728757	41.1	56.5	7.18	-107	24.2	99.9	0.40		
38	2002/1/28	SS-SF-03-38	22 53'20"	89 13'81"	2532700	728773	UK	83.6	7.23	-119	24.5	87.7	0.40		
39	2002/1/28	SS-SF-03-39	22 53'19"	89 13'81"	2532705	728772	UK	83.7	7.09	-102	24.6	104.7	0.50		
40	2002/1/28	SS-SF-03-40	22 53'21"	89 13'79"	2532727	728741	42.7	54.7	7.18	-132	25.1	74.3	0.40	0.18	
41	2002/1/28	SS-SF-03-41	22 53'23"	89 13'79"	2532759	728735	48.8	57.3	7.21	-109	24.8	97.5	0.40		
42	2002/1/28	SS-SF-03-42	22 53'22"	89 13'80"	2532748	728765	64.0	55.4	7.20	-107	25.1	99.3	0.40		
43	2002/1/28	SS-SF-03-43	22 53'23"	89 13'78"	2532764	728728	UK	49.2	7.19	-115	24.8	91.5	0.40		
44	2002/1/28	SS-SF-03-44	22 53'24"	89 13'78"	2532773	728724	56.4	51.2	7.23	-130	24.4	76.8	0.40		
45	2002/1/28	SS-SF-03-45	22 53'25"	89 13'79"	2532795	728745	UK	49.7	7.21	-108	24.8	98.5	0.40		
46	2002/1/28	SS-SF-03-46	22 53'24"	89 13'80"	2532775	728766	73.2	49.7	7.24	-108	24.7	98.6	0.40		
47	2002/1/28	SS-SF-03-47	22 53'25"	89 13'81"	2532794	728778	UK	74.6	7.19	-118	24.3	88.9	0.40		
48	2002/1/29	SS-SF-03-48	22 53'22"	89 13'81"	2532748	728777	UK	51.2	7.23	-118	24.5	88.7	0.40		
49	2002/1/29	SS-SF-03-49	22 53'24"	89 13'82"	2532778	728799	61.0	50.3	7.19	-110	24.8	96.5	0.40	0.18	
50	2002/2/28	SS-SF-03-50	22 52'98"	89 13'71"	2532299	728826	38.1	36.2	6.94	-80	26.8	125.1	0.1		

Table 3.2.10 Results of Screening Survey (Bajitpur: No.1 to No.72)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/26	SS-BJ-04-01	22 53'32"	89 13'29"	2533320	728206	41.5	52.4	6.83	-102	23.9	105.2	0.40		
2	2002/1/26	SS-BJ-04-02	22 53'33"	89 13'29"	2533341	728224	47.2	42.9	6.90	-129	24.9	77.4	0.30		
3	2002/1/26	SS-BJ-04-03	22 53'33"	89 13'28"	2533345	728279	51.8	51.9	7.01	-135	24.8	71.5	0.30		
4	2002/1/26	SS-BJ-04-04	22 53'33"	89 13'26"	2533336	728136	36.6	74.4	6.99	-137	25.0	69.4	0.20		
5	2002/1/26	SS-BJ-04-05	22 53'35"	89 13'26"	2533381	728141	36.6	73.2	6.99	-97	24.6	109.7	0.30		
6	2002/1/26	SS-BJ-04-06	22 53'32"	89 13'30"	2533301	728251	42.7	68.3	6.96	-117	24.7	89.6	0.30		
7	2002/1/26	SS-BJ-04-07	22 53'34"	89 13'31"	2533380	728260	73.2	71.8	7.14	-102	25.1	104.3	0.50		
8	2002/1/26	SS-BJ-04-08	22 53'29"	89 13'32"	2533228	728210	48.8	73.2	6.96	-116	24.8	90.5	0.50		
9	2002/1/26	SS-BJ-04-09	22 53'28"	89 13'34"	2533181	728346	51.8								Unused
10	2002/1/26	SS-BJ-04-10	22 53'28"	89 13'33"	2533186	728332	51.8	115.8	6.71	-111	25.4	95.1	0.40	0.18	
11	2002/1/26	SS-BJ-04-11	22 53'27"	89 13'35"	2533163	728383	56.4	78.3	7.02	-126	24.4	80.8	0.30		
12	2002/1/26	SS-BJ-04-12	22 53'26"	89 13'36"	2533144	728424	64.0	82.4	6.83	-130	25.6	75.9	0.30		
13	2002/1/26	SS-BJ-04-13	22 53'25"	89 13'37"	2533109	728448	47.2	88.5	6.95	-128	24.2	78.9	0.50		
14	2002/1/27	SS-BJ-04-14	22 53'26"	89 13'38"	2533153	728483	61.0	68.5	6.98	-131	25.1	75.3	0.40		
15	2002/1/27	SS-BJ-04-15	22 53'24"	89 13'38"	2533073	728479	UK	78.2	6.96	-132	24.8	74.5	0.60		
16	2002/1/27	SS-BJ-04-16	22 53'25"	89 13'39"	2533091	728511	47.2	87.5	6.92	-147	24.2	59.9	0.50		
17	2002/1/27	SS-BJ-04-17	22 53'25"	89 13'41"	2533087	728563	51.8	90.3	6.90	-129	24.8	77.5	0.50		
18	2002/1/27	SS-BJ-04-18	22 53'24"	89 13'41"	2533090	728553	48.8	93.6	6.89	-133	24.9	73.4	0.60		
19	2002/1/27	SS-BJ-04-19	22 53'24"	89 13'42"	2533072	728585	51.8	57.2	6.93	-151	24.1	56.0	0.50		
20	2002/1/27	SS-BJ-04-20	22 53'23"	89 13'40"	2533044	728538	UK	95.6	6.84	-97	25.4	109.1	0.60	0.32	
21	2002/1/27	SS-BJ-04-21	22 53'22"	89 13'40"	2533023	728538	38.1	58.3	7.08	-119	24.7	87.6	0.50		
22	2002/1/27	SS-BJ-04-22	22 53'22"	89 13'43"	2533023	728613	47.2	83.3	6.94	-136	25.6	69.9	0.60		
23	2002/1/27	SS-BJ-04-23	22 53'23"	89 13'42"	2533054	728603	47.2	89.7	6.99	-103	25.1	103.3	0.50		
24	2002/1/27	SS-BJ-04-24	22 53'21"	89 13'42"	2532986	728685	47.2	50.4	7.00	-141	25.4	65.1	0.40		
25	2002/1/27	SS-BJ-04-25	22 53'21"	89 13'43"	2532965	728620	51.8	72.9	7.09	-117	25.4	89.1	0.50		
26	2002/1/27	SS-BJ-04-26	22 53'23"	89 13'44"	2533033	728654	73.2	68.3	7.01	-107	24.8	99.5	0.70		
27	2002/1/28	SS-BJ-04-27	22 53'23"	89 13'46"	2533049	728707	56.4	85.3	6.92	-122	24.7	84.6	0.50		
28	2002/1/28	SS-BJ-04-28	22 53'47"	89 1347"	2533069	728740	53.3	90.2	6.94	-131	24.5	75.7	0.60		
29	2002/1/28	SS-BJ-04-29	22 53'25"	89 13'47"	2533106	728724	UK	89.3	6.90	-146	24.9	60.4	0.40		
30	2002/1/28	SS-BJ-04-30	22 53'25"	89 13'46"	2533112	728703	UK	52.7	6.95	-127	24.0	80.1	0.40	0.24	
31	2002/1/28	SS-BJ-04-31	22 53'32"	89 13'25"	2533322	728092	56.4	89.7	6.96	-112	24.5	94.7	0.40		
32	2002/1/28	SS-BJ-04-32	22 53'33"	89 13'24"	2533345	728072	50.3	50.3	6.93	-97	24.7	109.6	0.30		
33	2002/1/28	SS-BJ-04-33	22 53'33"	89 13'25"	2533346	728100	45.7	77.3	6.90	-133	23.4	74.5	0.50		
34	2002/1/28	SS-BJ-04-34	22 53'32"	89 13'23"	2533322	728052	47.2	89.8	6.79	-121	23.5	86.4	0.40		
35	2002/1/28	SS-BJ-04-35	22 53'33"	89 13'23"	2533331	728039	45.7	102.3	6.91	-133	22.9	74.9	0.40		
36	2002/1/29	SS-BJ-04-36	22 53'35"	89 13'25"	2533401	728098	51.8	81.5	6.92	-72	24.5	134.7	0.40		
37	2002/1/29	SS-BJ-04-37	22 53'36"	89 13'26"	2533440	728115	65.5	56.0	6.97	-102	25.0	104.4	0.50		
38	2002/1/29	SS-BJ-04-38	22 53'37"	89 13'27"	2533467	728145	47.2	82.9	6.98	-59	25.1	147.3	0.20		
39	2002/1/29	SS-BJ-04-39	22 53'39"	89 13'27"	2533514	728156	UK	52.1	7.03	-116	25.1	90.3	0.30		
40	2002/1/29	SS-BJ-04-40	22 53'37"	89 13'26"	2533465	728178	UK	85.4	6.84	-76	24.7	130.6	0.20	0.10	
41	2002/1/29	SS-BJ-04-41	22 53'37"	89 13'29"	2533468	728198	51.8								Unused
42	2002/1/29	SS-BJ-04-42	22 53'38"	89 13'29"	2533502	728203	51.8	87.5	6.95	-87	25.0	119.4	0.20		
43	2002/1/29	SS-BJ-04-43	22 53'39"	89 13'27"	2533546	728167	61.0	58.2	7.18	-89	24.2	117.9	0.20		
44	2002/1/29	SS-BJ-04-44	22 53'39"	89 13'25"	2533521	728082	42.7	57.7	7.08	-79	24.5	127.7	0.20		
45	2002/1/29	SS-BJ-04-45	22 53'39"	89 13'23"	2533536	728057	51.8	63.4	7.01	-86	25.1	120.3	0.30		
46	2002/1/29	SS-BJ-04-46	22 53'40"	89 13'24"	2533559	728081	54.9	73.1	7.00	-103	25.1	103.3	0.40		
47	2002/1/29	SS-BJ-04-47	22 53'39"	89 13'24"	2533561	728053	51.8	62.2	7.03	-107	25.3	99.2	0.20		
48	2002/1/29	SS-BJ-04-48	22 53'41"	89 13'24"	2533578	728053	UK	52.6	7.12	-131	24.6	75.7	0.10		
49	2002/1/29	SS-BJ-04-49	22 53'41"	89 13'24"	2533601	728055	UK								Unused
50	2002/1/29	SS-BJ-04-50	22 53'41"	89 13'24"	2533599	728079	42.7	63.8	6.86	-61	25.3	145.2	0.10	0.085	
51	2002/1/30	SS-BJ-04-51	22 53'43"	89 13'25"	2533648	728093	47.2	89.5	7.08	-71	24.6	135.7	0.20		
52	2002/1/30	SS-BJ-04-52	22 53'42"	89 13'26"	2533633	728022	47.2	63.2	6.99	-82	25.3	124.2	0.40		
53	2002/1/30	SS-BJ-04-53	22 53'42"	89 13'25"	2533614	728080	UK	68.3	7.06	-93	24.4	113.8	0.20		
54	2002/1/30	SS-BJ-04-54	22 53'43"	89 13'23"	2533662	728051	38.1	56.2	6.96	-62	24.8	144.5	0.20		
55	2002/1/30	SS-BJ-04-55	22 53'43"	89 13'22"	2533662	728019	40.2	63.6	6.99	-87	24.4	119.8	0.30		
56	2002/1/30	SS-BJ-04-56	22 53'46"	89 13'22"	2533745	728013	51.8	70.4	6.86	-87	25.5	119.0	0.30		
57	2002/1/30	SS-BJ-04-57	22 53'46"	89 13'22"	2533748	728008	47.2	67.1	7.04	-53	25.3	153.2	0.50		
58	2002/1/30	SS-BJ-04-58	22 53'46"	89 13'21"	2533750	727993	45.7	58.8	7.07	-107	25.3	99.2	0.40		

Table 3.2.10 Results of Screening Survey (Bajitpur: No.1 to No.72)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
59	2002/1/30	SS-BJ-04-59	22 53'47"	89 13'23"	2533788	728036	62.5	69.2	7.03	-91	25.2	115.2	0.50		
60	2002/1/30	SS-BJ-04-60	22 53'47"	89 13'22"	2533763	728000	47.2	73.3	6.99	-102	24.9	104.4	0.30	0.11	
61	2002/1/30	SS-BJ-04-61	22 53'47"	89 13'23"	2533774	728031	33.5	67.3	6.96	-109	24.8	97.5	0.50		
62	2002/1/30	SS-BJ-04-62	22 53'47"	89 13'23"	2533760	728029	48.8	52.3	7.05	-98	25.2	108.2	0.40		
63	2002/1/30	SS-BJ-04-63	22 53'48"	89 13'25"	2533804	728079	UK	61.6	7.03	-59	24.9	147.4	0.50		
64	2002/1/30	SS-BJ-04-64	22 53'48"	89 13'23"	2533806	728026	UK								Unused
65	2002/1/30	SS-BJ-04-65	22 53'51"	89 13'18"	2533884	727890	48.8	58.5	7.09	-68	25.0	138.4	0.50		
66	2002/1/30	SS-BJ-04-66	22 53'50"	89 13'18"	2533874	727886	45.7	56.5	7.11	-95	25.6	110.8	0.30		
67	2002/1/30	SS-BJ-04-67	22 53'51"	89 13'17"	2533878	727915	42.7	68.7	7.16	-71	25.3	135.2	0.40		
68	2002/1/30	SS-BJ-04-68	22 53'50"	89 13'18"	2533848	727894	51.8	59.3	7.11	-91	25.0	115.4	0.50		
69	2002/1/30	SS-BJ-04-69	22 53'51"	89 13'16"	2533881	727840	UK	59.3	7.11	-91	25.0	115.4	0.50		
70	2002/1/30	SS-BJ-04-70	22 53'48"	89 13'18"	2533805	727894	51.8	62.0	7.02	-81	25.0	125.4	0.40	0.21	
71	2002/1/30	SS-BJ-04-71	22 53'47"	89 13'19"	2533777	727912	48.8	57.4	7.04	-89	24.8	117.5	0.50	0.19	
72	2002/2/28	SS-BJ-04-72	22 53'78"	89 13'37"	2533759	728016	61.0								Unused

Table 3.2.11 Results of Screening Survey (Sabdia: No.1 to No.192)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/30	SS-SB-03-01	22 53'56"	89 13'35"	2533370	727991	30.5								Unused
2	2002/1/30	SS-SB-03-02	22 53'59"	89 13'36"	2533419	727996	36.6	83.3	7.20	-97	24.3	109.9	0.30		
3	2002/1/30	SS-SB-03-03	22 53'62"	89 13'32"	2533467	727931	45.7	54.4	7.23	-109	24.8	97.5	0.30		
4	2002/1/30	SS-SB-03-04	22 53'62"	89 13'33"	2533479	727946	UK	55.3	7.21	-109	24.5	97.7	0.20		
5	2002/1/30	SS-SB-03-05	22 53'60"	89 13'31"	2533436	727911	54.9	82.9	7.24	-108	25.1	98.3	0.00		
6	2002/1/30	SS-SB-03-06	22 53'61"	89 13'29"	2533456	727971	UK	84.0	7.25	-109	25.1	97.3	0.30		
7	2002/1/30	SS-SB-03-07	22 53'62"	89 13'17"	2533464	727679	38.1	48.8	7.27	-115	25.2	91.2	0.20		
8	2002/1/30	SS-SB-03-08	22 53'64"	89 13'16"	2533505	727658	41.1	59.1	7.26	-118	24.7	88.6	0.30		
9	2002/1/30	SS-SB-03-09	22 53'65"	89 13'15"	2533516	727640	48.8								Unused
10	2002/1/30	SS-SB-03-10	22 53'63"	89 13'13"	2533492	727558	UK	54.3	7.25	-131	24.8	75.5	0.07	0.085	
11	2002/1/30	SS-SB-03-11	22 53'65"	89 13'13"	2533519	727608	61.0	55.4	7.26	-125	25.1	81.3	0.30		
12	2002/1/30	SS-SB-03-12	22 53'68"	89 13'12"	2533554	727594	UK	49.3	7.26	-108	24.8	98.5	0.20		
13	2002/1/30	SS-SB-03-13	22 53'55"	89 13'10"	2533592	727558	UK	57.3	7.29	-109	24.8	97.5	0.10		
14	2002/1/30	SS-SB-03-14	22 53'67"	89 13'09"	2533553	727541	UK	52.5	7.30	-108	24.9	98.4	0.10		
15	2002/1/30	SS-SB-03-15	22 53'71"	89 13'09"	2533616	727537	48.8	84.5	7.31	-116	25.1	90.3	0.20		
16	2002/1/30	SS-SB-03-16	22 53'67"	89 13'07"	2533649	727509	UK	54.4	7.31	-125	24.7	81.6	0.10		
17	2002/1/30	SS-SB-03-17	22 53'67"	89 13'07"	2533560	727493	UK	52.2	7.32	-131	25.1	75.3	0.30		
18	2002/1/30	SS-SB-03-18	22 53'67"	89 13'04"	2533560	727456	25.9	55.2	7.29	-126	24.6	80.7	0.10		
19	2002/1/31	SS-SB-03-19	22 53'70"	89 13'07"	2533617	727507	25.9	54.8	7.13	-107	24.3	99.9	0.02		
20	2002/1/31	SS-SB-03-20	22 53'70"	89 13'06"	2533610	727483	35.1	58.7	7.09	-109	25.1	97.3	0.08	0.056	
21	2002/1/31	SS-SB-03-21	22 53'70"	89 13'02"	2533606	727414	35.1	83.9	7.03	-107	24.7	99.6	0.20		
22	2002/1/31	SS-SB-03-22	22 53'72"	89 13'02"	2533656	727418	41.1	92.3	7.02	-102	24.8	104.5	0.20		
23	2002/1/31	SS-SB-03-23	22 53'73"	89 13'03"	2533673	727435	41.1	124.1	7.05	-108	24.7	98.6	0.20		
24	2002/1/31	SS-SB-03-24	22 53'73"	89 13'01"	2533679	727403	25.9	59.8	7.01	-114	24.3	92.9	0.30		
25	2002/1/31	SS-SB-03-25	22 53'71"	89 13'00"	2533628	727383	UK	58.2	7.09	-116	24.9	90.4	0.20		
26	2002/1/31	SS-SB-03-26	22 53'72"	89 12'97"	2533647	727339	25.9	52.3	7.01	-131	25.1	75.3	0.30		
27	2002/1/31	SS-SB-03-27	22 53'76"	89 12'98"	2533612	727349	25.9	53.8	7.15	-113	24.7	93.6	0.20		
28	2002/1/31	SS-SB-03-28	22 53'75"	89 12'96"	2533698	727321	UK	49.8	7.15	-127	25.1	79.3	0.30		
29	2002/2/1	SS-SB-03-29	22 53'76"	89 12'96"	2533717	727306	25.9	87.3	7.11	-124	24.7	82.6	0.30		
30	2002/2/1	SS-SB-03-30	22 53'78"	89 12'99"	2533749	727355	30.5	56.3	7.08	-129	24.8	77.5	0.08	0.046	
31	2002/2/1	SS-SB-03-31	22 53'78"	89 13'00"	2533756	727367	25.9								Unused
32	2002/2/1	SS-SB-03-32	22 53'76"	89 12'94"	2533720	727284	18.3	92.2	7.13	-137	25.1	69.3	0.30		
33	2002/2/1	SS-SB-03-33	22 53'76"	89 12'92"	2533715	727251	48.8	57.3	7.08	-133	25.1	73.3	0.30		
34	2002/2/1	SS-SB-03-34	22 53'79"	89 12'95"	2533763	727299	24.4	50.7	7.11	-133	25.1	73.3	0.20		
35	2002/2/1	SS-SB-03-35	22 53'79"	89 12'95"	2533778	727293	UK	57.7	7.11	-132	25.1	74.3	0.20		
36	2002/2/1	SS-SB-03-36	22 53'80"	89 12'97"	2533783	727323	25.9	88.6	7.04	-125	25.1	81.3	0.30		
37	2002/2/1	SS-SB-03-37	22 53'82"	89 12'99"	2533829	727362	UK	49.8	7.11	-127	24.7	79.6	0.30		
38	2002/2/1	SS-SB-03-38	22 53'79"	89 12'92"	2533773	727246	UK	55.4	7.13	-115	24.9	91.4	0.30		
39	2002/2/1	SS-SB-03-39	22 53'82"	89 12'93"	2533821	727254	UK	78.3	7.12	-109	25.1	97.3	0.30		
40	2002/2/1	SS-SB-03-40	22 53'88"	89 13'03"	2533938	727431	33.5	109.0	7.12	-112	24.7	94.6	0.30		
41	2002/2/1	SS-SB-03-41	22 53'81"	89 12'81"	2533807	727243	UK	75.3	7.09	-113	24.8	93.5	0.30		
42	2002/2/1	SS-SB-03-42	22 53'80"	89 12'91"	2533798	727221	UK	59.8	7.12	-126	25.2	80.2	0.20		
43	2002/2/1	SS-SB-03-43	22 53'82"	89 12'91"	2533821	727220	UK	57.3	7.04	-120	25.1	86.3	0.30		
44	2002/2/1	SS-SB-03-44	22 53'81"	89 12'90"	2533801	727201	UK	69.3	7.15	-132	25.1	74.3	0.20		
45	2002/2/1	SS-SB-03-45	22 53'82"	89 12'90"	2533820	727218	UK								Unused
46	2002/2/2	SS-SB-03-46	22 53'82"	89 12'88"	2533812	727180	38.1	65.3	7.03	-103	24.3	103.9	0.30		
47	2002/2/2	SS-SB-03-47	22 53'81"	89 12'87"	2533816	727184	UK	67.8	7.08	-109	24.3	97.9	0.30		
48	2002/2/2	SS-SB-03-48	22 53'80"	89 12'85"	2533794	727131	UK	57.8	7.07	-104	24.8	102.5	0.30		
49	2002/2/2	SS-SB-03-49	22 53'85"	89 12'91"	2533884	727220	48.8	59.7	7.05	-103	24.8	103.5	0.03		
50	2002/2/2	SS-SB-03-50	22 53'88"	89 12'85"	2533839	727116	UK	59.3	7.10	-121	24.9	85.4	0.30	0.22	
51	2002/2/2	SS-SB-03-51	22 53'84"	89 12'86"	2533853	727145	UK	56.4	7.08	-112	25.1	94.3	0.30		
52	2002/2/2	SS-SB-03-52	22 53'84"	89 12'86"	2533865	727143	50.3	57.9	7.11	-121	24.7	85.6	0.40		
53	2002/2/2	SS-SB-03-53	22 53'85"	89 12'85"	2533889	727120	UK	55.3	7.09	-110	24.6	96.7	0.30		
54	2002/2/2	SS-SB-03-54	22 53'83"	89 12'88"	2533848	727168	38.1								Unused
55	2002/2/2	SS-SB-03-55	22 53'83"	89 12'83"	2533841	727092	UK	56.9	7.13	-121	25.1	85.3	0.40		
56	2002/2/2	SS-SB-03-56	22 53'83"	89 12'82"	2533850	727073	21.3	49.8	7.12	-119	24.6	87.7	0.40		
57	2002/2/2	SS-SB-03-57	22 53'88"	89 12'83"	2533926	727086	UK	67.8	7.19	-129	25.1	77.3	0.40		
58	2002/2/2	SS-SB-03-58	22 53'87"	89 12'80"	2533909	727042	47.2	69.8	7.14	-118	25.3	88.2	0.30		
59	2002/2/2	SS-SB-03-59	22 53'88"	89 12'81"	2533930	727046	UK	73.5	7.09	-109	24.7	97.6	0.30		
60	2002/2/2	SS-SB-03-60	22 53'89"	89 12'80"	2533955	727040	33.5	88.7	7.21	-131	25.1	75.3	0.40	0.13	
61	2002/2/2	SS-SB-03-61	22 53'89"	89 12'82"	2533950	727072	UK								Unused
62	2002/2/2	SS-SB-03-62	22 53'90"	89 12'85"	2533970	727127	UK	70.5	7.18	-125	24.9	81.4	0.40		
63	2002/2/2	SS-SB-03-63	22 53'91"	89 12'82"	2534001	727071	UK	73.5	7.15	-132	25.1	74.3	0.30		
64	2002/2/2	SS-SB-03-64	22 53'92"	89 12'85"	2534008	727116	36.6	61.8	7.04	-114	25.1	92.3	0.30		
65	2002/2/2	SS-SB-03-65	22 53'94"	89 12'78"	2534037	727008	16.8	90.3	7.13	-109	24.8	97.5	0.40		
66	2002/2/2	SS-SB-03-66	22 53'93"	89 12'77"	2534021	726976	16.8	94.3	7.09	-117	24.9	89.4	0.40		
67	2002/2/2	SS-SB-03-67	22 53'95"	89 12'78"	2534056	726991	UK	78.7	7.17	-121	24.9	85.4	0.40		
68	2002/2/2	SS-SB-03-68	22 53'96"	89 12'76"	2534081	726962	UK	93.2	7.19	-126	24.7	80.6	0.40		
69	2002/2/2	SS-SB-03-69	22 53'96"	89 12'75"	2534084	726949	UK	79.3	7.11	-127	24.1	80.0	0.40		
70	2002/2/2	SS-SB-03-70	22 53'95"	89 12'75"	2534066	726955	UK	87.3	7.14	-131	24.9	75.4	0.40	0.16	
71	2002/2/3	SS-SB-03-71	22 53'93"	89 12'83"	2534025	726082	56.4	93.8	7.19	-121	24.7	85.6	0.40		
72	2002/2/3	SS-SB-03-72	22 53'94"	89 12'84"	2534054	726105	UK	87.6	7.03	-109	24.9	97.4	0.30		
73	2002/2/3	SS-SB-03-73	22 53'93"	89 12'82"	2534034	727061	UK	97.6	7.11	-119	24.1	88.0	0.40		
74	2002/2/3	SS-SB-03-74	22 53'93"	89 12'82"	2534074	727061	56.4	73.8	7.17	-125	25.1	81.3	0.40		
75	2002/2/3	SS-SB-03-75	22 53'95"	89 12'81"	2534081	727052	UK	63.3	7.13	-131	24.9	75.4	0.40		
76	2002/2/3	SS-SB-03-76	22 53'98"	89 12'80"	2534116	727039	33.5	75.2	7.09	-108	24.8	98.5	0.40		
77	2002/2/3	SS-SB-03-77	22 53'98"	89 12'82"	2534120	727067	UK	94.3	7.03	-131	25.1	75.3	0.40		
78	2002/2/3	SS-SB-03-78	22 53'99"	89 12'80"	2534138	727028	56.4	63.8	7.03	-103	25.2	103.2	0.40		
79	2002/2/3	SS-SB-03-79	22 54'00"	89 12'81"	2534156	727051	56.4	79.3	7.21	-108	24.6	98.7	0.40		
80	2002/2/3	SS-SB-03-80	22 54'02"	89 12'80"	2534184	727026	54.9	105.0	7.06	-129	24.9	77.4	0.40	0.092	
81	2002/2/3	SS-SB-03-81	22 54'01"	89 12'90"	2534184	727200	56.4	79.3	7.15	-133	25.1	73.3	0.30		
82	2002/2/3	SS-SB-03-82	22 54'08"	89 12'87"	2534315	727154	UK	93.7	7.05	-131	24.9	75.4	0.06		
83	2002/2/3	SS-SB-03-83	22 54'14"	89 12'85"	2534119	727168	UK	76.4	7.06	-128	25.3	78.2	0.03		
84	2002/2/3	SS-SB-03-84	22 54'11"	89 12'88"	2534363	727161	UK								Unused
85	2002/2/3	SS-SB-03-85	22 54'00"	89 12'78"	2534167	726997	56.4	76.3	7.10	-103	24.4	103.8	0.40		
86	2002/2/3	SS-SB-03-86	22 54'01"	89 12'78"	2534179	726991	UK	86.3	7.14	-108	24.5	98.7	0.40		
87	2002/2/3	SS-SB-03-87	22 54'03"	89 12'78"	2534210	727016	56.4	83.2	7.12	-121	24.7	85.6	0.40		
88	2002/2/3	SS-SB-03-88	22 54'02"	89 12'87"	2534194	727980	54.9	79.6	7.19	-123	24.9	83.4	0.40		
89	2002/2/3	SS-SB-03-89	22 54'02"	89 12'76"	2534188	727962	54.9	86.3	7.03	-112	24.3	94.9	0.40		
90	2002/2/3	SS-SB-03-90	22 53'99"	89 12'76"	2534141	727970	56.4	80.2	7.17	-133	25.3	73.2	0.40	0.12	
91	2002/2/3	SS-SB-03-91	22 53'99"	89 12'76"	2534141	726970	56.4	83.0	7.13	-131	25.3	75.2	0.40		
92	2002/2/3	SS-SB-03-92	22 54'01"	89 12'75"	2534167	726942	42.7	77.5	7.19	-117	25.1	89.3	0.40		
93	2002/2/3	SS-SB-03-93	22 54'01"	89 12'75"	2534184	726936	42.7	60.9	7.08	-129	24.9	77.4	0.40		
94	2002/2/4	SS-SB-03-94	22 54'03"	89 12'76"	2534211	726950	56.4	67.9	7.01	-103	24.9	103.4	0.30		
95	2002/2/4	SS-SB-03-95	22 54'02"	89 12'73"	2534197	726908	48.8	73.6	7.03	-109	24.4	97.8	0.30		

Table 3.2.11 Results of Screening Survey (Sabdia: No.1 to No.192)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
96	2002/2/4	SS-SB-03-96	22 54'03"	89 12'73"	2534213	726912	54.9	65.8	7.05	-115	25.1	91.3	0.60		
97	2002/2/4	SS-SB-03-97	22 54'04"	89 12'74"	2534223	726934	54.9	59.7	7.05	-103	24.1	104.0	0.40		
98	2002/2/4	SS-SB-03-98	22 54'04"	89 12'72"	2534225	726995	54.9	67.8	7.08	-121	24.1	86.0	0.40		
99	2002/2/4	SS-SB-03-99	22 54'05"	89 12'76"	2534246	726967	25.9	92.3	7.04	-119	24.8	87.5	0.40		
100	2002/2/4	SS-SB-03-100	22 54'05"	89 12'76"	2534267	726958	25.9	89.8	7.09	-121	24.3	85.9	0.50	0.18	
101	2002/2/4	SS-SB-03-101	22 54'08"	89 12'76"	2534307	726962	UK	71.5	7.19	-110	24.3	96.9	0.40		
102	2002/2/4	SS-SB-03-102	22 54'08"	89 12'75"	2534309	726950	56.4	92.0	7.13	-119	24.1	88.0	0.50		
103	2002/2/4	SS-SB-03-103	22 54'09"	89 12'75"	2534317	726936	UK	91.3	7.08	-129	24.1	78.0	0.50		
104	2002/2/4	SS-SB-03-104	22 54'08"	89 12'74"	2534300	726919	UK	87.1	7.17	-113	25.1	93.3	0.40		
105	2002/2/4	SS-SB-03-105	22 54'10"	89 12'74"	2534335	726918	48.8	89.3	7.14	-113	25.1	93.3	0.40		
106	2002/2/4	SS-SB-03-106	22 54'18"	89 12'82"	2534493	727060	51.8	97.3	7.16	-121	24.8	85.5	0.06		
107	2002/2/4	SS-SB-03-107	22 54'19"	89 12'87"	2534508	727147	UK	102.0	7.06	-131	24.1	76.0	0.06		
108	2002/2/4	SS-SB-03-108	22 54'20"	89 12'86"	2534522	727130	56.4	112.3	7.03	-102	24.3	104.9	0.08		
109	2002/2/4	SS-SB-03-109	22 54'20"	89 12'87"	2534532	727157	UK	94.3	7.09	-123	25.1	83.3	0.50		
110	2002/2/4	SS-SB-03-110	22 54'21"	89 12'88"	2534563	727167	UK	107.3	7.05	-118	25.1	88.3	0.03	0.070	
111	2002/2/4	SS-SB-03-111	22 54'24"	89 12'85"	2534591	727113	56.4	93.0	7.15	-108	24.7	98.6	0.07		
112	2002/2/4	SS-SB-03-112	22 54'22"	89 12'87"	2534571	727143	UK	103.0	7.08	-118	24.9	88.4	0.03		
113	2002/2/4	SS-SB-03-113	22 54'23"	89 12'87"	2534585	727148	54.9	109.6	7.11	-118	25.1	88.3	0.30		
114	2002/2/4	SS-SB-03-114	22 54'25"	89 12'89"	2534613	727175	56.4	83.6	7.23	-131	24.8	75.5	0.06		
115	2002/2/4	SS-SB-03-115	22 54'21"	89 12'91"	2534545	727208	50.3	87.6	7.12	-129	25.1	77.3	0.30		
116	2002/2/4	SS-SB-03-116	22 54'21"	89 12'92"	2534542	727235	48.8	97.3	7.01	-97	24.6	109.7	0.10		
117	2002/2/4	SS-SB-03-117	22 54'21"	89 12'94"	2534556	727258	UK	105.0	7.06	-126	24.9	80.4	0.20		
118	2002/2/5	SS-SB-03-118	22 53'89"	89 13'00"	2533967	727371	UK	69.3	7.19	-107	25.2	99.2	0.30		
119	2002/2/5	SS-SB-03-119	22 53'90"	89 13'01"	2533970	727388	25.9	63.7	7.13	-103	25.1	103.3	0.30		
120	2002/2/5	SS-SB-03-120	22 53'91"	89 13'01"	2533999	727386	30.5	78.5	7.18	-123	25.4	83.1	0.05	0.036	
121	2002/2/5	SS-SB-03-121	22 53'90"	89 13'02"	2533976	727418	25.9								Unused
122	2002/2/5	SS-SB-03-122	22 53'92"	89 13'01"	2534022	727399	36.6	73.6	7.13	-109	24.9	97.4	0.40		
123	2002/2/5	SS-SB-03-123	22 53'93"	89 12'97"	2534034	727323	25.9	83.2	7.10	-110	25.1	96.3	0.05		
124	2002/2/5	SS-SB-03-124	22 53'94"	89 13'00"	2534056	727382	21.3	71.9	7.08	-115	24.7	91.6	0.30		
125	2002/2/5	SS-SB-03-125	22 53'93"	89 13'02"	2534069	727405	56.4	69.8	7.11	-117	25.0	89.4	0.30		
126	2002/2/5	SS-SB-03-126	22 53'95"	89 13'05"	2534067	727452	UK	65.8	7.17	-119	24.8	87.5	0.20		
127	2002/2/5	SS-SB-03-127	22 53'92"	89 13'06"	2534021	727477	UK	79.3	7.01	-102	25.3	104.2	0.01		
128	2002/2/5	SS-SB-03-128	22 53'95"	89 13'06"	2534160	727478	UK	71.3	7.06	-105	25.3	101.2	0.05		
129	2002/2/5	SS-SB-03-129	22 53'92"	89 13'09"	2534022	727522	25.9	81.6	7.13	-121	25.1	85.3	0.03		
130	2002/2/5	SS-SB-03-130	22 53'89"	89 13'06"	2533959	727477	48.8	92.4	7.14	-127	25.2	79.2	0.02	0.020	
131	2002/2/5	SS-SB-03-131	22 53'92"	89 13'07"	2533997	727500	UK	86.5	7.08	-116	24.3	90.9	0.30		
132	2002/2/5	SS-SB-03-132	22 53'87"	89 13'03"	2533919	727434	UK								Unused
133	2002/2/5	SS-SB-03-133	22 53'86"	89 13'05"	2533905	727464	UK	68.9	7.04	-115	25.2	91.2	0.02		
134	2002/2/5	SS-SB-03-134	22 53'85"	89 13'07"	2533877	727508	UK	87.3	7.01	-118	24.9	88.4	0.08		
135	2002/2/5	SS-SB-03-135	22 53'88"	89 13'10"	2533934	727543	25.9	91.6	7.13	-104	25.3	102.2	0.02		
136	2002/2/5	SS-SB-03-136	22 53'82"	89 13'12"	2533842	727591	27.4	93.2	7.21	-129	25.3	77.2	0.30		
137	2002/2/5	SS-SB-03-137	22 53'87"	89 13'09"	2533919	727528	UK								Unused
138	2002/2/5	SS-SB-03-138	22 53'88"	89 13'07"	2533935	727504	25.9	68.5	7.20	-131	25.2	75.2	0.04		
139	2002/2/5	SS-SB-03-139	22 53'88"	89 13'07"	2533962	727516	48.8	79.5	7.18	-127	25.1	79.3	0.00		
140	2002/2/5	SS-SB-03-140	22 53'99"	89 13'17"	2534154	727660	UK	91.6	7.13	-132	25.1	74.3	0.07	0.088	
141	2002/2/6	SS-SB-03-141	22 54'38"	89 13'86"	2534869	727116	85.3	106.7	7.09	-103	24.3	103.9	0.40		
142	2002/2/6	SS-SB-03-142	22 54'38"	89 13'86"	2534871	727116	36.6	98.6	7.05	-110	24.5	96.7	0.40		
143	2002/2/6	SS-SB-03-143	22 54'39"	89 13'87"	2534879	727140	53.3	90.5	7.04	-121	24.1	86.0	0.40		
144	2002/2/6	SS-SB-03-144	22 54'40"	89 13'86"	2534899	727152	48.8	94.7	7.09	-113	24.2	93.9	0.40		
145	2002/2/6	SS-SB-03-145	22 54'42"	89 13'81"	2534930	727041	38.1	75.3	7.08	-121	24.9	85.4	0.50		
146	2002/2/6	SS-SB-03-146	22 54'41"	89 13'80"	2534911	727027	48.8	89.3	7.12	-112	24.7	94.6	0.50		
147	2002/2/6	SS-SB-03-147	22 54'38"	89 13'81"	2534861	727035	48.8	97.8	7.06	-123	25.1	83.3	0.50		
148	2002/2/6	SS-SB-03-148	22 54'37"	89 13'82"	2534834	727048	25.9	87.5	7.02	-115	24.6	91.7	0.40		
149	2002/2/6	SS-SB-03-149	22 54'37"	89 13'79"	2534833	727008	UK	103.0	7.17	-129	25.1	77.3	0.40		
150	2002/2/6	SS-SB-03-150	22 54'37"	89 13'79"	2534833	727011	48.8	83.2	7.14	-127	24.6	79.7	0.40	0.17	
151	2002/2/6	SS-SB-03-151	22 54'35"	89 13'78"	2534794	726995	UK								Unused
152	2002/2/6	SS-SB-03-152	22 54'35"	89 13'88"	2534800	727157	UK								Unused
153	2002/2/6	SS-SB-03-153	22 54'32"	89 13'84"	2534739	727095	36.6	76.3	7.18	-124	24.7	82.6	0.04		
154	2002/2/7	SS-SB-03-154	22 54'36"	89 13'88"	2534820	727166	UK	97.8	7.13	-123	24.8	83.5	0.40		
155	2002/2/7	SS-SB-03-155	22 54'37"	89 13'88"	2534842	727152	UK	93.4	7.08	-109	24.6	97.7	0.40		
156	2002/2/7	SS-SB-03-156	22 54'38"	89 13'87"	2534865	727139	56.4	98.7	7.04	-115	24.9	91.4	0.40		
157	2002/2/7	SS-SB-03-157	22 54'39"	89 13'88"	2534873	727153	UK	88.3	7.09	-119	25.1	87.3	0.40		
158	2002/2/7	SS-SB-03-158	22 54'36"	89 13'89"	2534824	727167	UK	90.7	7.06	-120	25.3	86.2	0.40		
159	2002/2/7	SS-SB-03-159	22 54'37"	89 13'89"	2534846	727178	56.4	87.9	7.11	-117	24.9	89.4	0.50		
160	2002/2/7	SS-SB-03-160	22 54'36"	89 13'90"	2534824	727188	48.8	102.6	7.15	-127	24.7	79.6	0.40	0.20	
161	2002/2/7	SS-SB-03-161	22 54'35"	89 13'90"	2534802	727195	48.8	94.7	7.16	-121	24.6	85.7	0.40		
162	2002/2/7	SS-SB-03-162	22 54'35"	89 13'91"	2534814	727216	UK	91.4	7.05	-109	24.9	97.4	0.50		
163	2002/2/7	SS-SB-03-163	22 54'35"	89 13'92"	2534811	727231	56.4	82.7	7.09	-112	24.7	94.6	0.30		
164	2002/2/7	SS-SB-03-164	22 54'35"	89 13'91"	2534806	727214	56.4	79.4	7.02	-120	24.8	86.5	0.40		
165	2002/2/7	SS-SB-03-165	22 54'38"	89 13'89"	2534864	727182	UK	89.6	7.06	-117	24.2	89.9	0.30		
166	2002/2/7	SS-SB-03-166	22 54'38"	89 13'89"	2534867	727171	50.3	83.8	7.10	-123	24.3	83.9	0.40		
167	2002/2/7	SS-SB-03-167	22 54'41"	89 13'90"	2534915	727186	UK	78.7	7.15	-126	25.2	80.2	0.40		
168	2002/2/7	SS-SB-03-168	22 54'41"	89 13'89"	2534918	727178	UK	77.2	7.13	-121	25.3	85.2	0.50		
169	2002/2/7	SS-SB-03-169	22 54'41"	89 13'88"	2534911	727166	48.8	81.6	7.16	-119	24.9	87.4	0.50		
170	2002/2/7	SS-SB-03-170	22 54'40"	89 13'90"	2534892	727184	42.7	97.3	7.17	-125	24.8	81.5	0.50	0.33	
171	2002/2/7	SS-SB-03-171	22 54'36"	89 13'93"	2534828	727242	UK	102.3	7.03	-107	24.1	100.0	0.40		
172	2002/2/7	SS-SB-03-172	22 54'35"	89 13'94"	2534803	727269	UK	103.6	7.01	-108	24.8	98.5	0.50		
173	2002/2/7	SS-SB-03-173	22 54'35"	89 13'94"	2534815	727257	UK	96.2	7.04	-103	24.2	103.9	0.50		
174	2002/2/7	SS-SB-03-174	22 54'36"	89 13'94"	2534830	727260	UK	98.2	7.10	-112	24.7	94.6	0.40		
175	2002/2/7	SS-SB-03-175	22 54'36"	89 13'94"	2534830	727260	UK	105.6	7.06	-115	25.1	91.3	0.50		
176	2002/2/7	SS-SB-03-176	22 54'34"	89 13'96"	2534789	727288	UK	107.8	7.03	-121	25.3	85.2	0.40		
177	2002/2/7	SS-SB-03-177	22 54'34"	89 13'95"	2534789	727282	65.5	89.8	7.13	-127	24.9	79.4	0.40		
178	2002/2/7	SS-SB-03-178	22 54'34"	89 13'95"	2534799	727274	48.8	91.8	7.13	-129	25.3	77.2	0.30		
179	2002/2/7	SS-SB-03-179	22 54'38"	89 13'95"	2534846	727277	48.8	118.7	7.17	-126	25.1	80.3	0.50		
180	2002/2/7	SS-SB-03-180	22 54'35"	89 13'92"	2534807	727223	18.3	123.7	7.18	-139	25.2	67.2	0.50	0.23	
181	2002/2/8	SS-SB-03-181	22 54'35"	89 13'91"	2534888	727206	56.4	98.6	7.11	-131	24.9	75.4	0.20		
182	2002/2/8	SS-SB-03-182	22 54'33"	89 13'94"	2534783	727265	50.3	102.0	7.19	-133	25.1	73.3	0.50		
183	2002/2/8	SS-SB-03-183	22 54'33"	89 13'92"	2534783	727236	UK	93.8	7.03	-130	24.8	76.5	0.40		

Table 3.2.11 Results of Screening Survey (Sabdia: No.1 to No.192)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
184	2002/2/8	SS-SB-03-184	22 54'33"	89 13'91"	2534762	727218	48.8	97.3	7.04	-123	25.2	83.2	0.40		
185	2002/2/8	SS-SB-03-185	22 54'92"	89 12'34"	2534707	727226	61.0	89.4	7.05	-109	25.0	97.4	0.40		
186	2002/2/8	SS-SB-03-186	22 54'28"	89 12'92"	2534685	727234	48.8	94.7	7.05	-118	25.1	88.3	0.40		
187	2002/2/8	SS-SB-03-187	22 54'34"	89 12'95"	2534790	727274	UK	131.7	7.13	-124	25.3	82.2	0.50		
188	2002/2/8	SS-SB-03-188	22 54'30"	89 12'96"	2534718	727300	70.1	92.7	7.06	-108	25.3	98.2	0.50		
189	2002/2/8	SS-SB-03-189	22 54'32"	89 12'96"	2534750	727300	UK								Unused
190	2002/2/11	SS-SB-03-190	22 54'39"	89 12'88"	2534884	727159	UK	86.7	7.05	-97	26.2	108.5	0.40	0.22	
191	2002/2/11	SS-SB-03-191	22 54'39"	89 12'88"	2534884	727159	UK								Unused
192	2002/2/11	SS-SB-03-192	22 54'40"	89 12'88"	2534901	727152	UK	83.3	7.06	-92	25.8	113.5	0.40		

Table 3.2.12 Results of Screening Survey (Kesabpur: No.1 to No.226)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/4/2	SS-KS-02-01	22 54'35"	89 12'50"	2535223	727090	390.1	90.3	7.36	-77	25.1	129.3	0.02		
2	2002/4/2	SS-KS-02-02	22 54'35"	89 12'50"	2535247	727083	UK	90.3	7.01	-99	24.3	107.9	0.50		
3	2002/4/2	SS-KS-02-03	22 54'32"	89 12'52"	2535133	727128	41.1	52.5	7.13	-99	24.9	107.4	0.50		
4	2002/4/2	SS-KS-02-04	22 54'32"	89 12'52"	2535143	727144	41.1	52.9	7.11	-99	25.4	107.1	0.50		
5	2002/4/2	SS-KS-02-05	22 54'32"	89 12'52"	2535148	727127	44.2								Unused
6	2002/4/2	SS-KS-02-06	22 54'33"	89 12'52"	2535215	727122	45.7	51.9	6.93	-89	25.2	117.2	0.40		
7	2002/4/2	SS-KS-02-07	22 54'36"	89 12'52"	2535276	727128	54.9	51.6	7.22	-102	24.2	104.9	0.40		
8	2002/4/2	SS-KS-02-08	22 54'37"	89 12'52"	2535305	727126	59.4	51.8	7.15	-101	24.5	105.7	0.50		
9	2002/4/2	SS-KS-02-09	22 54'39"	89 12'52"	2535349	727141	UK	52.5	7.13	-99	25.2	107.2	0.50		
10	2002/4/2	SS-KS-02-10	22 54'40"	89 12'52"	2535385	727144	UK	51.8	7.14	-101	23.8	106.2	0.40	0.21	
11	2002/5/2	SS-KS-02-11	22 54'41"	89 12'54"	2535412	727172	45.7	56.6	7.05	-89	25.3	117.2	0.10		
12	2002/5/2	SS-KS-02-12	22 54'40"	89 12'56"	2535395	727235	UK								Unused
13	2002/5/2	SS-KS-02-13	22 54'38"	89 12'56"	2535315	727260	68.6	51.8	7.18	-96	24.8	110.5	0.20		
14	2002/5/2	SS-KS-02-14	22 54'37"	89 12'57"	2535332	727277	67.1	49.9	7.23	-101	25.2	105.2	0.60		
15	2002/5/2	SS-KS-02-15	22 54'38"	89 12'57"	2535315	727298	76.2	50.1	7.24	-99	24.0	108.1	0.50		
16	2002/5/2	SS-KS-02-16	22 54'38"	89 12'58"	2535320	727304	91.4	53.1	7.27	-98	24.5	108.7	0.50		
17	2002/5/2	SS-KS-02-17	22 54'38"	89 13'00"	2535341	727354	51.8	57.4	7.24	-103	24.5	103.7	0.60		
18	2002/5/2	SS-KS-02-18	22 54'39"	89 12'58"	2535366	727290	51.8	57.3	7.20	-95	24.3	111.9	0.30		
19	2002/5/2	SS-KS-02-19	22 54'37"	89 12'59"	2535294	727317	UK	42.9	7.30	-99	24.9	107.4	0.60		
20	2002/5/2	SS-KS-02-20	22 54'36"	89 12'58"	2535283	727314	UK	53.4	7.27	-89	25.1	117.3	0.50	0.20	
21	2002/5/2	SS-KS-02-21	22 54'37"	89 12'58"	2535283	727298	50.3	43.4	7.27	-89	25.0	117.4	0.60		
22	2002/5/2	SS-KS-02-22	22 54'36"	89 12'57"	2535282	727278	50.3	50.8	7.26	-93	25.0	113.4	0.50		
23	2002/5/2	SS-KS-02-23	22 54'36"	89 12'57"	2535282	727260	61.0	48.3	7.33	-103	25.3	103.2	0.60		
24	2002/5/2	SS-KS-02-24	22 54'36"	89 12'56"	2535265	727243	56.4	43.3	7.28	-101	25.4	105.1	0.60		
25	2002/5/2	SS-KS-02-25	22 54'37"	89 12'54"	2535263	727238	65.5	42.8	7.35	-104	25.3	102.2	0.40		
26	2002/5/2	SS-KS-02-26	22 54'35"	89 12'56"	2535248	727232	61.0	56.2	7.13	-100	25.1	106.3	0.50		
27	2002/5/2	SS-KS-02-27	22 54'35"	89 12'56"	2535240	727240	56.4	44.9	7.18	-101	24.7	105.6	0.40		
28	2002/5/2	SS-KS-02-28	22 54'35"	89 12'56"	2535230	727245	57.9	45.2	7.30	-112	24.8	94.5	0.50		
29	2002/5/2	SS-KS-02-29	22 54'34"	89 12'56"	2535209	727258	56.4	45.6	7.31	-110	24.8	96.5	0.50		
30	2002/5/2	SS-KS-02-30	22 54'33"	89 12'57"	2535189	727275	39.6	48.5	7.20	-98	24.4	108.8	0.40	0.18	
31	2002/5/2	SS-KS-02-31	22 54'34"	89 12'57"	2535194	727263	42.7	51.4	7.21	-65	25.2	141.2	0.50		
32	2002/5/2	SS-KS-02-32	22 54'34"	89 12'57"	2535201	727274	48.8	48.5	7.25	-89	25.0	117.4	0.50		
33	2002/5/2	SS-KS-02-33	22 54'34"	89 12'58"	2535202	727296	UK	51.9	7.35	-99	24.5	107.7	0.60		
34	2002/5/2	SS-KS-02-34	22 54'35"	89 12'58"	2535228	727300	64.0	47.1	7.30	-101	25.4	105.1	0.60		
35	2002/5/2	SS-KS-02-35	22 54'33"	89 12'58"	2535167	727287	39.6	49.3	7.21	-91	24.5	115.7	0.50		
36	2002/5/2	SS-KS-02-36	22 54'32"	89 12'55"	2535164	727228	54.9	47.1	7.22	-93	25.0	113.4	0.60		
37	2002/5/2	SS-KS-02-37	22 54'35"	89 12'59"	2535241	727337	51.8	49.8	7.31	-79	24.8	127.5	0.40		
38	2002/6/2	SS-KS-02-38	22 54'36"	89 12'59"	2535261	727323	39.6	45.9	7.16	-82	24.3	124.9	0.10		
39	2002/6/2	SS-KS-02-39	22 54'36"	89 12'58"	2535267	727307	UK	42.9	7.24	-69	25.0	137.4	0.50		
40	2002/6/2	SS-KS-02-40	22 54'35"	89 12'59"	2535234	727339	44.2	42.9	7.20	-81	24.6	125.7	0.60	0.20	
41	2002/6/2	SS-KS-02-41	22 54'36"	89 12'59"	2535257	727337	53.0	43.5	7.22	-77	24.2	129.9	0.60		
42	2002/6/2	SS-KS-02-42	22 54'34"	89 12'59"	2535213	727336	74.7	47.5	7.35	-89	25.4	117.1	0.50		
43	2002/6/2	SS-KS-02-43	22 54'32"	89 12'58"	2535137	727297	UK	45.5	7.30	-83	24.4	123.8	0.60		
44	2002/6/2	SS-KS-02-44	22 54'32"	89 12'58"	2535137	727295	UK	48.6	7.50	-78	25.2	128.2	0.50		
45	2002/6/2	SS-KS-02-45	22 54'31"	89 12'58"	2535114	727295	51.8	49.5	7.35	-95	25.7	110.9	0.60		
46	2002/6/2	SS-KS-02-46	22 54'30"	89 12'58"	2535097	727303	UK	106.1	7.10	-79	25.6	126.9	0.30		
47	2002/6/2	SS-KS-02-47	22 54'30"	89 12'59"	2535098	727327	67.1	47.1	7.36	-97	25.3	109.2	0.50		
48	2002/6/2	SS-KS-02-48	22 54'27"	89 12'58"	2535004	727307	76.2	80.2	7.40	-75	25.8	130.8	0.50		
49	2002/6/2	SS-KS-02-49	22 54'31"	89 13'00"	2535105	727351	45.7	49.5	7.34	-52	25.4	154.1	0.50		
50	2002/6/2	SS-KS-02-50	22 54'30"	89 13'01"	2535084	727388	45.7	52.7	7.27	-77	24.8	129.5	0.50	0.22	
51	2002/6/2	SS-KS-02-51	22 54'30"	89 13'02"	2535089	727411	30.5								Unused
52	2002/6/2	SS-KS-02-52	22 54'30"	89 13'03"	2535081	727441	365.8	68.8	7.24	-150	27.1	54.9	0.02	0.0054	
53	2002/6/2	SS-KS-02-53	22 54'31"	89 13'03"	2535113	727431	51.8	48.3	7.32	-70	26.0	135.6	0.50		
54	2002/6/2	SS-KS-02-54	22 54'31"	89 13'02"	2535113	727420	61.0	46.8	7.35	-83	25.4	123.1	0.60		
55	2002/6/2	SS-KS-02-55	22 54'31"	89 13'04"	2535122	727466	51.8	47.8	7.26	-99	24.3	107.9	0.60		
56	2002/6/2	SS-KS-02-56	22 54'33"	89 13'03"	2535170	727450	39.6	51.5	7.33	-98	24.2	108.9	0.50		
57	2002/6/2	SS-KS-02-57	22 54'31"	89 13'04"	2535131	727480	67.1	52.1	7.20	-98	24.5	108.7	0.40		
58	2002/6/2	SS-KS-02-58	22 54'32"	89 13'05"	2531766	727488	54.9	59.8	7.02	-98	25.4	108.1	0.50		
59	2002/7/2	SS-KS-02-59	22 54'33"	89 13'05"	2535191	727492	64.0	106.1	7.19	-106.3	24.1	100.7	0.30		
60	2002/7/2	SS-KS-02-60	22 54'33"	89 13'05"	2535182	727511	61.0	84.0	7.20	-89	24.5	117.7	0.50	0.24	
61	2002/7/2	SS-KS-02-61	22 54'35"	89 13'05"	2535201	727493	42.7	50.9	7.22	-99	23.8	108.2	0.40		
62	2002/7/2	SS-KS-02-62	22 54'34"	89 13'05"	2535214	727493	61.0	44.5	7.12	-90	24.5	116.7	0.50		
63	2002/7/2	SS-KS-02-63	22 54'34"	89 13'06"	2535220	727519	70.1	44.9	7.15	-99	23.5	108.4	0.50		

Table 3.2.12 Results of Screening Survey (Kesabpur: No.1 to No.226)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
64	2002/7/2	SS-KS-02-64	22 54'35"	89 13'07"	2535229	727546	UK	42.4	7.13	-95	24.5	111.7	0.50		
65	2002/7/2	SS-KS-02-65	22 54'35"	89 13'08"	2535226	727578	UK	48.4	7.25	-84	25.1	122.3	0.60		
66	2002/7/2	SS-KS-02-66	22 54'33"	89 13'06"	2535208	727560	56.4	99.5	7.15	-83	24.3	123.9	0.40		
67	2002/7/2	SS-KS-02-67	22 54'35"	89 13'08"	2535236	727598	36.6	102.1	7.11	-89	23.9	118.2	0.40		
68	2002/7/2	SS-KS-02-68	22 54'35"	89 13'09"	2535238	727618	39.6	49.5	7.14	-79	24.5	127.7	0.50		
69	2002/7/2	SS-KS-02-69	22 54'35"	89 13'09"	2535233	727622	45.7								Unused
70	2002/7/2	SS-KS-02-70	22 54'34"	89 13'09"	2535203	727618	UK	52.9	7.20	-101	24.1	106.0	0.40	0.18	
71	2002/7/2	SS-KS-02-71	22 54'34"	89 13'09"	2535209	727609	UK	52.5	7.17	-112	24.7	94.6	0.60		
72	2002/7/2	SS-KS-02-72	22 54'34"	89 13'10"	2535299	727647	UK	53.9	7.19	-99	26.1	106.6	0.50		
73	2002/7/2	SS-KS-02-73	22 54'34"	89 13'09"	2535218	727628	61.0	50.2	7.22	-110	24.9	96.4	0.50		
74	2002/11/2	SS-KS-02-74	22 54'34"	89 13'10"	2535204	727647	48.8	50.2	7.24	-120	25.2	86.2	0.70		
75	2002/11/2	SS-KS-02-75	22 54'35"	89 13'05"	2535238	727503	62.5	45.5	7.16	-99	24.0	108.1	0.50		
76	2002/7/2	SS-KS-02-76	22 54'35"	89 13'05"	2535233	727491	38.1	51.5	7.20	-142	24.0	65.1	0.40		
77	2002/7/2	SS-KS-02-77	22 54'36"	89 13'05"	2535259	727501	61.0	45.7	7.20	-89	23.5	118.4	0.50		
78	2002/7/2	SS-KS-02-78	22 54'35"	89 13'06"	2535234	727515	UK	45.4	7.13	-80	23.5	127.4	0.50		
79	2002/7/2	SS-KS-02-79	22 54'35"	89 13'05"	2535242	727539	51.8	44.5	7.14	-69	24.1	138.0	0.50		
80	2002/7/2	SS-KS-02-80	22 54'35"	89 13'06"	2535254	727521	51.8	43.8	7.16	-69	25.0	137.4	0.50	0.21	
81	2002/7/2	SS-KS-02-81	22 54'35"	89 13'06"	2535248	727522	16.8	122.2	6.85	-68	24.8	138.5	0.03		
82	2002/7/2	SS-KS-02-82	22 54'36"	89 13'06"	2535263	727519	61.0	43.5	7.18	-78	24.7	128.6	0.50		
83	2002/7/2	SS-KS-02-83	22 54'36"	89 13'07"	2535277	727547	61.0	56.2	7.14	-120	25.9	85.7	0.50		
84	2002/9/2	SS-KS-02-84	22 54'37"	89 13'00"	2535304	727355	42.7	102.6	7.20	-90	25.3	116.2	0.30		
85	2002/9/2	SS-KS-02-85	22 54'37"	89 13'02"	2535298	727403	UK	107.7	7.20	-90	25.3	116.2	0.30		
86	2002/9/2	SS-KS-02-86	22 54'36"	89 13'03"	2535264	727427	93.0	51.3	7.30	-95	25.2	111.2	0.40		
87	2002/9/2	SS-KS-02-87	22 54'35"	89 13'01"	2535251	727401	15.8	56.2	6.96	-101	25.5	105.0	0.08		
88	2002/9/2	SS-KS-02-88	22 54'36"	89 13'02"	2535254	727422	15.2	53.7	6.91	-107	25.7	98.9	0.09		
89	2002/9/2	SS-KS-02-89	22 54'36"	89 13'03"	2535256	727432	UK	106.6	7.20	-95	25.3	111.2	0.40		
90	2002/9/2	SS-KS-02-90	22 54'35"	89 13'04"	2535230	727463	54.9	56.2	7.03	-90	25.5	116.0	0.30	0.21	
91	2002/9/2	SS-KS-02-91	22 54'36"	89 13'04"	2535271	727465	UK	51.3	7.20	-100	25.6	105.9	0.50		
92	2002/9/2	SS-KS-02-92	22 54'36"	89 13'04"	2535270	727475	61.0	54.8	7.17	-95	24.8	111.5	0.50		
93	2002/9/2	SS-KS-02-93	22 54'36"	89 13'05"	2535257	727493	56.4	52.3	7.30	-93	25.2	113.2	0.30		
94	2002/9/2	SS-KS-02-94	22 54'36"	89 13'05"	2535266	727507	56.4	45.9	7.13	-98	26.6	107.2	0.40		
95	2002/9/2	SS-KS-02-95	22 54'36"	89 13'06"	2535278	727529	67.1	56.2	7.22	-102	25.6	103.9	0.40		
96	2002/9/2	SS-KS-02-96	22 54'37"	89 13'05"	2535291	727488	UK	113.2	7.10	-87	25.9	118.7	0.20		
97	2002/9/2	SS-KS-02-97	22 54'37"	89 13'04"	2535316	727473	UK	110.9	7.21	-109	26.0	96.6	0.40		
98	2002/9/2	SS-KS-02-98	22 54'39"	89 13'04"	2535350	727478	UK	44.2	7.17	-88	25.1	118.3	0.50		
99	2002/9/2	SS-KS-02-99	22 54'39"	89 13'04"	2535365	727458	UK	48.3	7.09	-95	25.1	111.3	0.40		
100	2002/9/2	SS-KS-02-100	22 54'37"	89 13'06"	2535305	727535	UK	44.4	7.30	-86	26.0	119.6	0.40	0.20	
101	2002/9/2	SS-KS-02-101	22 54'37"	89 13'06"	2535311	727521	61.0	46.6	7.40	-100	26.1	105.6	0.20		
102	2002/9/2	SS-KS-02-102	22 54'38"	89 13'05"	2535345	727513	UK	54.4	7.11	-89	26.0	116.6	0.40		
103	2002/9/2	SS-KS-02-103	22 54'38"	89 13'07"	2535321	727548	61.0	51.5	7.01	-90	26.0	115.6	0.40		
104	2002/9/2	SS-KS-02-104	22 54'37"	89 13'07"	2535313	727567	67.1	48.0	7.15	-110	25.5	96.0	0.40		
105	2002/11/2	SS-KS-02-105	22 54'36"	89 13'08"	2535279	727579	73.2	61.4	7.22	-113	26.3	92.4	0.50		
106	2002/11/2	SS-KS-02-106	22 54'36"	89 13'08"	2535280	727575	65.5	110.4	7.06	-104	26 4	101.4	0.50		
107	2002/10/2	SS-KS-02-107	22 54'37"	89 13'08"	2535314	727582	56.4	41.7	7.30	-84	26.0	121.6	0.40		
108	2002/10/2	SS-KS-02-108	22 54'37"	89 13'08"	2535321	727577	67.1	42.9	7.28	-85	25.9	120.7	0.40		
109	2002/10/2	SS-KS-02-109	22 54'37"	89 13'08"	2535292	727592	UK	48.0	7.33	-90	26.5	115.3	0.30		
110	2002/10/2	SS-KS-02-110	22 54'36"	89 13'09"	2535270	727601	59.4	44.3	7.26	-95	25.9	110.7	0.40	0.24	
111	2002/10/2	SS-KS-02-111	22 54'38"	89 13'09"	2535325	727614	61.0	47.8	7.21	-107	25.8	98.8	0.30		
112	2002/10/2	SS-KS-02-112	22 54'38"	89 13'09"	2535334	727612	56.4	44.3	7.20	-107	25.9	98.7	0.40		
113	2002/10/2	SS-KS-02-113	22 54'38"	89 13'08"	2535349	727596	67.1	54.8	7.30	-106	24.8	100.5	0.30		
114	2002/10/2	SS-KS-02-114	22 54'39"	89 13'09"	2535366	727620	54.9	51.3	7.02	-107	25.6	98.9	0.30		
115	2002/10/2	SS-KS-02-115	22 54'39"	89 13'10"	2535387	727651	54.9	50.5	7.11	-112	26.0	93.6	0.30		
116	2002/10/2	SS-KS-02-116	22 54'40"	89 13'10"	2535399	727630	9.1								Unused
117	2002/10/2	SS-KS-02-117	22 54'40"	89 13'10"	2535394	727638	45.7	50.5	7.17	-109	26.0	96.6	0.30		
118	2002/10/2	SS-KS-02-118	22 54'40"	89 13'10"	2535412	727652	45.7	56.2	7.39	-115	24.0	92.1	0.40		
119	2002/10/2	SS-KS-02-119	22 54'40"	89 13'09"	2535388	727614	65.5	43.3	7.14	-115	26.1	90.6	0.50		
120	2002/10/2	SS-KS-02-120	22 54'40"	89 13'08"	2535388	727590	UK	42.7	7.20	-110	26.0	95.6	0.50	0.23	
121	2002/10/2	SS-KS-02-121	22 54'40"	89 13'09"	2535409	727619	609.6	50.9	7.12	-113	26.0	92.6	0.40		
122	2002/10/2	SS-KS-02-122	22 54'41"	89 13'10"	2535419	727626	61.0	44.3	7.13	-113	25.9	92.7	0.40		
123	2002/10/2	SS-KS-02-123	22 54'40"	89 13'10"	2535409	727642	61.0	48.0	7.36	-117	26.5	88.3	0.40		
124	2002/10/2	SS-KS-02-124	22 54'41"	89 13'10"	2535429	727637	61.0	48.0	7.30	-118	25.8	87.8	0.40		
125	2002/10/2	SS-KS-02-125	22 54'41"	89 13'11"	2535418	727654	51.8	51.2	7.03	-115	25.5	91.0	0.40		
126	2002/12/2	SS-KS-02-126	22 54'40"	89 13'11"	2535411	727655	48.8	50.6	7.35	-89	25.8	116.8	0.40		
127	2002/12/2	SS-KS-02-127	22 54'41"	89 13'11"	2535433	727661	73.2	50.5	7.35	-99	25.6	106.9	0.50		
128	2002/12/2	SS-KS-02-128	22 54'42"	89 13'10"	2535446	727653	56.4	50.2	7.39	-112	25.5	94.0	0.30		
129	2002/12/2	SS-KS-02-129	22 54'42"	89 13'10"	2535462	727650	51.8	50.2	7.47	-100	25.4	106.1	0.30		
130	2002/12/2	SS-KS-02-130	22 54'42"	89 13'10"	2535444	727645	51.8	48.4	7.49	-110	25.6	95.9	0.60	0.26	
131	2002/12/2	SS-KS-02-131	22 54'42"	89 13'10"	2535443	727637	UK	53.5	7.36	-101	25.4	105.1	0.40		
132	14/2/2002	SS-KS-02-132	22 54'43"	89 13'10"	2535480	727630	UK	52.5	7.35	-99	25.8	106.8	0.40		
133	2002/12/2	SS-KS-02-133	22 54'43"	89 13'09"	2535489	727621	47.2	46.9	7.52	-79	25.2	127.2	0.40		
134	2002/12/2	SS-KS-02-134	22 54'43"	89 13'10"	2535503	727636	51.8	54.5	7.60	-101	25.4	105.1	0.20		
135	2002/12/2	SS-KS-02-135	22 54'43"	89 13'09"	2535480	727605	56.4	46.2	7.52	-102	25.2	104.2	0.50		
136	2002/12/2	SS-KS-02-136	22 54'43"	89 13'08"	2535479	727575	59.4	42.9	7.50	-95	26.0	110.6	0.30		
137	2002/12/2	SS-KS-02-137	22 54'42"	89 13'08"	2535470	727568	51.8	49.3	7.52	-90	25.9	115.7	0.20		
138	2002/12/2	SS-KS-02-138	22 54'45"	89 13'07"	2535470	727557	51.8	89.0	7.58	-95	25.1	111.3	0.50		
139	2002/12/2	SS-KS-02-139	22 54'42"	89 13'07"	2535457	727547	61.0	47.2	7.55	-103	27.0	101.9	0.50		
140	2002/12/2	SS-KS-02-140	22 54'42"	89 13'07"	2535445	727568	48.8	48.9	7.53	-98	26.4	107.4	0.40	0.24	
141	2002/12/2	SS-KS-02-141	22 54'41"	89 13'07"	2535430	727567	59.4	49.0	7.56	-98	25.9	107.7	0.50		
142	2002/12/2	SS-KS-02-142	22 54'41"	89 13'07"	2535432	727565	51.8	49.5	7.55	-105	25.2	101.2	0.40		
143	2002/12/2	SS-KS-02-143	22 54'41"	89 13'08"	2535439	727585	51.8	52.5	7.49	-109	26.1	96.6	0.60		
144	2002/12/2	SS-KS-02-144	22 54'43"	89 13'07"	2535492	727563	51.8	47.9	7.49	-100	25.7	105.9	0.60		
145	2002/12/2	SS-KS-02-145	22 54'44"	89 13'09"	2535531	727598	54.9	51.5	7.60	-109	25.6	96.9	0.50		
146	2002/12/2	SS-KS-02-146	22 54'43"	89 13'06"	2535497	727517	56.4	52.3	7.44	-90	25.7	115.9	0.50		
147	2002/12/2	SS-KS-02-147	22 54'44"	89 13'06"	2535526	727517	UK	43.7	7.49	-101	25.5	105.0	0.60		
148	2002/12/2	SS-KS-02-148	22 54'44"	89 13'05"	2535529	727504	42.7	55.5	7.60	-98	25.6	107.9	0.50		
149	13/2/2002	SS-KS-02-149	22 54'45"	89 13'04"	2535552	727464	42.7	117.5	7.54	-88	25.4	118.1	0.40		
150	13/2/2002	SS-KS-02-150	22 54'45"	89 13'09"	2535589	727428	41.1	110.4	7.45	-99	25.7	106.9	0.40	0.19	
151	13/2/2002	SS-KS-02-151	22 54'48"	89 13'03"	2535531	727449	51.8	48.5	7.52	-98	25.9	107.7	0.50		
152	14/2/2002	SS-KS-02-152	22 54'47"	89 13'05"	2535598	727498	UK	49.5	7.49	-101	24.7	105.6	0.40		
153	13/2/2002	SS-KS-02-153	22 54'46"	89 13'05"	2535582	727502	47.2	52.0	7.45	-105	25.3	101.2	0.50		
154	2002/12/2	SS-KS-02-154	22 54'47"	89 13'06"	2535618	727537	42.7	49.8	7.45	-102	25.4	104.1	0.40		
155	13/2/2002	SS-KS-02-155	22 54'52"	89 13'03"	2535755	727453	UK	52.4	7.51	-96	25.6	109.9	0.40		
156	13/2/2002	SS-KS-02-156	22 54'38"	89 13'10"	2535334	727641	UK	46.5	7.41	-90	25.4	116.1	0.50		
157	13/2/2002	SS-KS-02-157	22 54'38"	89 13'11"	2535329	727660	51.8	47.1	7.42	-102	24.9	104.4	0.40		
158	13/2/2002	SS-KS-02-158	22 54'41"	89 13'10"	2535406	727657	UK	46.2	7.44	-101	24.5	105.7	0.40		

Table 3.2.12 Results of Screening Survey (Kesabpur: No.1 to No.226)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
159	13/2/2002	SS-KS-02-159	22 54'37"	89 13'11"	2535301	727680	UK	44.5	7.48	-89	25.6	116.9	0.50		
160	13/2/2002	SS-KS-02-160	22 54'38"	89 13'10"	2535320	727649	UK	45.2	7.50	-109	25.4	97.1	0.40		
161	13/2/2002	SS-KS-02-161	22 54'37"	89 13'11"	2535306	727684	91.4	44.7	7.57	-99	25.8	106.8	0.40		
162	13/2/2002	SS-KS-02-162	22 54'36"	89 13'11"	2535286	727682	54.9	47.5	7.63	-98	26.0	107.6	0.50		
163	13/2/2002	SS-KS-02-163	22 54'36"	89 13'11"	2535279	727682	UK	47.7	7.47	-90	25.7	115.9	0.20		
164	13/2/2002	SS-KS-02-164	22 54'35"	89 13'11"	2535242	727656	54.9	46.5	7.47	-101	25.8	104.8	0.50		
165	13/2/2002	SS-KS-02-165	22 54'35"	89 13'11"	2535230	727662	UK	47.1	7.40	-105	25.7	100.9	0.40		
166	13/2/2002	SS-KS-02-166	22 54'33"	89 13'10"	2535172	727644	64.0	45.3	7.42	-88	25.4	118.1	0.50		
167	13/2/2002	SS-KS-02-167	22 54'33"	89 13'10"	2535190	727650	65.5	60.1	7.47	-113	23.3	94.6	0.40		
168	13/2/2002	SS-KS-02-168	22 54'33"	89 13'10"	2535170	727640	56.4	45.8	7.60	-89	26.1	116.6	0.40		
169	13/2/2002	SS-KS-02-169	22 54'32"	89 13'09"	2535168	727626	UK	45.6	7.50	-88	25.9	117.7	0.60		
170	13/2/2002	SS-KS-02-170	22 54'31"	89 13'09"	2535124	727616	51.8	44.9	7.57	-99	25.6	106.9	0.30		
171	13/2/2002	SS-KS-02-171	22 54'31"	89 13'07"	2535135	727567	UK	44.7	7.60	-95	25.9	110.7	0.50		
172	13/2/2002	SS-KS-02-172	22 54'31"	89 13'07"	2535123	727568	51.8								Unused
173	13/2/2002	SS-KS-02-173	22 54'31"	89 13'07"	2535134	727564	36.6	45.2	7.43	-98	25.7	107.9	0.30		
174	13/2/2002	SS-KS-02-174	22 54'31"	89 13'06"	2535121	727531	41.1	46.5	7.44	-99	25.7	106.9	0.40		
175	13/2/2002	SS-KS-02-175	22 54'31"	89 13'06"	2535108	727531	UK	48.0	7.44	-100	25.1	106.3	0.40		
176	13/2/2002	SS-KS-02-176	22 54'30"	89 13'05"	2535092	727502	UK	56.9	7.35	-99	25.5	107.0	0.40		
177	13/2/2002	SS-KS-02-177	22 54'31"	89 13'31"	2535102	727483	UK	44.0	7.49	-101	25.5	105.0	0.40		
178	13/2/2002	SS-KS-02-178	22 54'30"	89 13'04"	2535087	727467	UK	48.0	7.54	-99	25.7	106.9	0.50		
179	14/2/2002	SS-KS-02-179	22 54'31"	89 12'56"	2535119	727243	67.1	45.6	7.55	-99	26.2	106.5	0.40		
180	14/2/2002	SS-KS-02-180	22 54'32"	89 12'57"	2535134	727279	UK	48.9	7.37	-87	26.3	118.4	0.40	0.20	
181	14/2/2002	SS-KS-02-181	22 54'32"	89 12'57"	2535134	727284	UK	52.3	7.38	-85	25.4	121.1	0.30		
182	13/2/2002	SS-KS-02-182	22 54'31"	89 13'10"	2535112	727633	UK	50.0	7.34	-101	25.6	104.9	0.30		
183	14/2/2002	SS-KS-02-183	22 54'31"	89 13'10"	2535116	727655	62.5	45.7	7.60	-98	25.6	107.9	0.30		
184	14/2/2002	SS-KS-02-184	22 54'31"	89 13'11"	2535118	727678	67.1	45.8	7.70	-99	25.6	106.9	0.50		
185	14/2/2002	SS-KS-02-185	22 54'31"	89 13'11"	2535131	727685	42.7	42.8	7.70	-93	25.8	112.8	0.50		
186	14/2/2002	SS-KS-02-186	22 54'32"	89 13'11"	2535146	727685	56.4	42.9	7.75	-97	25.0	109.4	0.40		
187	14/2/2002	SS-KS-02-187	22 54'34"	89 13'12"	2535197	727703	UK	42.5	7.75	-97	25.6	108.9	0.40		
188	14/2/2002	SS-KS-02-188	22 54'34"	89 13'12"	2535201	727695	51.8	43.3	7.75	-84	26.6	121.2	0.50		
189	14/2/2002	SS-KS-02-189	22 54'34"	89 13'12"	2535197	727711	50.3	45.3	7.80	-101	26.6	104.2	0.40		
190	14/2/2002	SS-KS-02-190	22 54'34"	89 13'12"	2535230	727706	62.5	46.5	7.78	-89	25.2	117.2	0.40	0.29	
191	14/2/2002	SS-KS-02-191	22 54'35"	89 13'11"	2535243	727684	67.1	44.6	7.77	-99	25.1	107.3	0.50		
192	14/2/2002	SS-KS-02-192	22 54'34"	89 13'13"	2535226	727715	61.0	47.9	7.74	-93	25.1	113.3	0.50		
193	14/2/2002	SS-KS-02-193	22 54'36"	89 13'13"	2535262	727721	UK	45.5	7.73	-101	25.6	104.9	0.40		
194	14/2/2002	SS-KS-02-194	22 54'36"	89 13'13"	2535268	727728	UK								Unused
195	14/2/2002	SS-KS-02-195	22 54'36"	89 13'14"	2535265	727751	51.8	52.5	7.59	-89	25.5	117.0	0.40		
196	14/2/2002	SS-KS-02-196	22 54'37"	89 13'13"	2535312	727721	UK	47.5	7.76	-92	25.6	113.9	0.40		
197	14/2/2002	SS-KS-02-197	22 54'37"	89 13'13"	2535319	727732	UK	45.0	7.80	-95	25.0	111.4	0.50		
198	14/2/2002	SS-KS-02-198	22 54'37"	89 13'13"	2535284	727727	51.8	54.1	7.64	-105	25.5	101.0	0.50		
199	14/2/2002	SS-KS-02-199	22 54'36"	89 13'12"	2535271	727710	61.0	45.6	7.89	-85	25.3	121.2	0.50		
200	14/2/2002	SS-KS-02-200	22 54'37"	89 13'12"	2535304	727709	51.8	50.5	7.61	-97	25.6	108.9	0.40		
201	16/2/2002	SS-KS-02-201	22 54'37"	89 13'13"	2535321	727723	57.9	44.9	7.70	-90	25.3	116.2	0.50		
202	16/2/2002	SS-KS-02-202	22 54'38"	89 13'12"	2535336	727705	56.4	46.9	7.64	-89	24.4	117.8	0.40		
203	16/2/2002	SS-KS-02-203	22 54'38"	89 13'12"	2535346	727699	51.8	50.0	7.68	-92	24.2	114.9	0.40		
204	16/2/2002	SS-KS-02-204	22 54'39"	89 13'12"	2535380	727690	UK	57.0	7.65	-102	24.8	104.5	0.40		
205	16/2/2002	SS-KS-02-205	22 54'40"	89 13'12"	2535399	727695	47.2	52.0	7.70	-102	25.2	104.2	0.60		
206	16/2/2002	SS-KS-02-206	22 54'34"	89 13'13"	2535203	727724	UK	50.0	7.74	-97	24.3	109.9	0.40		
207	16/2/2002	SS-KS-02-207	22 54'35"	89 13'14"	2535236	727754	51.8	52.0	7.68	-96	25.8	109.8	0.40		
208	16/2/2002	SS-KS-02-208	22 54'34"	89 13'14"	2535215	727756	106.7	50.9	7.70	-89	24.3	117.9	0.50		
209	16/2/2002	SS-KS-02-209	22 54'33"	89 13'14"	2535196	727750	56.4	54.5	7.68	-97	23.7	110.3	0.40		
210	16/2/2002	SS-KS-02-210	22 54'33"	89 13'14"	2535197	727749	54.9	54.9	7.70	-99	24.5	107.7	0.40	0.17	
211	16/2/2002	SS-KS-02-211	22 54'33"	89 13'14"	2535172	727751	UK	50.5	7.70	-93	25.2	113.2	0.40		
212	16/2/2002	SS-KS-02-212	22 54'32"	89 13'13"	2535152	727740	UK	52.4	7.65	-96	26.4	109.4	0.50		
213	16/2/2002	SS-KS-02-213	22 54'32"	89 13'13"	2535159	727724	51.8	50.0	7.69	-94	25.6	111.9	0.50		
214	16/2/2002	SS-KS-02-214	22 54'32"	89 13'12"	2535149	727715	51.8	50.0	7.67	-102	24.4	104.8	0.50		
215	16/2/2002	SS-KS-02-215	22 54'32"	89 13'12"	2535152	727711	504.1	49.0	7.72	-110	24.2	96.9	0.40		
216	16/2/2002	SS-KS-02-216	22 54'32"	89 13'12"	2535168	727714	36.6	55.0	7.65	-98	24.6	108.7	0.30		
217	16/2/2002	SS-KS-02-217	22 54'31"	89 13'13"	2535135	727739	51.8	45.7	7.69	-96	25.8	109.8	0.40		
218	16/2/2002	SS-KS-02-218	22 54'32"	89 13'15"	2535140	727792	UK	50.2	7.73	-97	25.1	109.3	0.30		
219	16/2/2002	SS-KS-02-219	22 54'31"	89 13'16"	2535136	727799	57.9								Unused
220	16/2/2002	SS-KS-02-220	22 54'34"	89 13'16"	2535206	727728	51.8	52.0	7.75	-100	25.8	105.8	0.50	0.21	
221	16/2/2002	SS-KS-02-221	22 54'33"	89 13'16"	2535177	727800	UK	48.9	7.73	-96	26.0	109.6	0.40		
222	16/2/2002	SS-KS-02-222	22 54'33"	89 13'16"	2535187	727805	54.9	49.9	7.81	-98	25.4	108.1	0.50		
223	16/2/2002	SS-KS-02-223	22 54'33"	89 13'15"	2535188	727798	48.8	55.7	7.69	-100	25.2	106.2	0.50		
224	4/3/2002	SS-KS-02-224	22 54'33"	89 13'11"	2535163	727692	UK	58.3	7.17	-102	26.2	103.5	0.40		
225	4/3/2002	SS-KS-02-225	22 54'34"	89 13'12"	2535225	727685	61.0	57.3	7.18	-93	26.4	112.4	0.50		
226	4/3/2002	SS-KS-02-226	22 54'34"	89 13'11"	2535187	727680	91.4	55.6	7.13	-96	26.2	109.5	0.30		

Table 3.2.13 Results of Screening Survey (Madhyakul: No.1 to No.253)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/31	SS-MD-04-01	22 56'28"	89 13'38"	2538728	728388	42.7	109.0	7.01	-88	24.6	118.7	0.60		
2	2002/1/31	SS-MD-04-02	22 56'28"	89 13'33"	2538726	728238	UK	96.0	7.19	-76	23.5	131.4	0.50		
3	2002/1/31	SS-MD-04-03	22 56'26"	89 13'39"	2538682	728407	36.6	119.0	7.07	-93	24.9	113.4	0.40		
4	2002/1/31	SS-MD-04-04	22 56'25"	89 13'39"	2538649	728421	UK	134.3	7.04	-92	24.2	114.9	0.50		
5	2002/1/31	SS-MD-04-05	22 56'27"	89 13'27"	2538681	728352	38.1	115.4	7.18	-96	24.8	110.5	0.50		
6	2002/1/31	SS-MD-04-06	22 56'23"	89 13'39"	2538569	728427	51.8	128.3	7.13	-97	24.7	109.6	0.50		
7	2002/1/31	SS-MD-04-07	22 56'23"	89 13'38"	2538576	728391	UK	120.3	7.12	-105	24.8	101.5	0.50		
8	2002/1/31	SS-MD-04-08	22 56'21"	89 13'38"	2538506	728377	79.2	139.3	7.20	-113	24.0	94.1	0.40		
9	2002/2/1	SS-MD-04-09	22 56'23"	89 13'36"	2538571	728318	51.8	116.3	6.93	-69	24.4	137.8	0.50		
10	2002/2/1	SS-MD-04-10	22 56'24"	89 13'31"	2538599	728205	UK	98.2	7.05	-62	24.1	145.0	0.50	0.18	
11	2002/2/1	SS-MD-04-11	22 56'24"	89 13'32"	2538592	728222	33.5	107.0	6.99	-75	24.2	131.9	0.50		
12	2002/2/1	SS-MD-04-12	22 56'20"	89 13'35"	2538506	728321	UK	68.6	7.10	-96	25.1	110.3	0.50		
13	2002/2/1	SS-MD-04-13	22 56'19"	89 13'34"	2538456	728282	59.4	122.1	7.42	-73	24.4	133.8	0.60		
14	2002/2/1	SS-MD-04-14	22 56'17"	89 13'34"	2538386	728269	UK	101.2	7.21	-79	23.7	128.3	0.40		
15	2002/2/1	SS-MD-04-15	22 56'15"	89 13'32"	2538329	728226	42.7	118.7	7.04	-113	24.8	93.5	0.40		
16	2002/2/1	SS-MD-04-16	22 56'20"	89 13'28"	2538476	728114	56.4	105.2	7.31	-124	24.6	82.7	0.50		
17	2002/2/1	SS-MD-04-17	22 56'21"	89 13'28"	2538525	728116	30.5	69.7	7.21	-88	23.7	119.3	0.70		
18	2002/2/1	SS-MD-04-18	22 56'17"	89 13'31"	2538377	728187	33.5	139.4	7.05	-132	24.4	74.8	0.50		
19	2002/2/1	SS-MD-04-19	22 56'17"	89 13'32"	2538379	728216	UK	142.5	7.15	-122	24.1	85.0	0.60		
20	2002/2/1	SS-MD-04-20	22 56'15"	89 13'26"	2538329	728055	29.0	116.3	7.18	-107	25.0	99.4	0.60	0.22	
21	2002/2/1	SS-MD-04-21	22 56'14"	89 13'31"	2538308	728183	38.1	105.9	7.31	-97	24.6	109.7	0.70		
22	2002/2/1	SS-MD-04-22	22 56'17"	89 13'26"	2538376	728140	79.2	97.6	7.30	-126	24.9	80.4	0.70		
23	2002/2/1	SS-MD-04-23	22 56'15"	89 13'25"	2538337	728030	UK	62.3	7.10	-115	25.0	91.4	0.60		
24	2002/2/1	SS-MD-04-24	22 56'16"	89 13'25"	2538358	728027	27.4	111.2	7.00	-115	25.3	91.2	0.50		
25	2002/2/1	SS-MD-04-25	22 56'07"	89 13'25"	2538073	728027	42.7	133.4	7.10	-123	25.2	83.2	0.50		
26	2002/2/1	SS-MD-04-26	22 56'03"	89 13'25"	2537960	728028	38.1	119.1	7.33	-107	24.2	99.9	0.80		
27	2002/2/1	SS-MD-04-27	22 56'03"	89 13'22"	2537954	727950	39.6	127.2	7.27	-109	25.0	97.4	0.70		
28	2002/2/1	SS-MD-04-28	22 56'04"	89 13'20"	2537981	727885	38.1	115.1	7.30	-113	24.7	93.6	0.70		
29	2002/2/2	SS-MD-04-29	22 55'59"	89 13'22"	2537854	727926	UK	98.6	7.38	-108	24.8	98.5	0.50		
30	2002/2/2	SS-MD-04-30	22 56'59"	89 13'21"	2537904	727927	59.4	82.3	7.40	-119	24.0	88.1	0.60	0.32	
31	2002/2/2	SS-MD-04-31	22 55'59"	89 13'20"	2537830	727892	44.2	99.3	7.19	-123	24.7	83.6	0.50		
32	2002/2/2	SS-MD-04-32	22 55'58"	89 13'22"	2537801	727936	57.9	100.7	7.04	-107	23.3	100.6	0.60		
33	2002/2/2	SS-MD-04-33	22 55'58"	89 13'20"	2537788	727890	UK	63.1	7.28	-122	24.4	84.8	0.60		
34	2002/2/2	SS-MD-04-34	22 55'58"	89 13'19"	2537809	727854	44.2	59.3	7.19	-115	25.2	91.2	0.60		
35	2002/2/2	SS-MD-04-35	22 55'59"	89 13'17"	2537831	727815	56.4	49.5	7.28	-135	25.1	71.3	0.60		
36	2002/2/2	SS-MD-04-36	22 55'57"	89 13'18"	2537772	727847	42.7	60.0	7.37	-128	24.2	78.9	0.40		
37	2002/2/2	SS-MD-04-37	22 55'57"	89 13'20"	2537766	727886	82.3	108.2	7.36	-134	25.2	72.2	0.60		
38	2002/2/2	SS-MD-04-38	22 55'54"	89 13'21"	2537683	727922	38.1	103.6	7.48	-109	24.4	97.8	0.60		
39	2002/2/2	SS-MD-04-39	22 55'55"	89 13'23"	2537711	727995	25.9	106.5	7.28	-108	24.6	98.7	0.50		
40	2002/2/2	SS-MD-04-40	22 55'54"	89 13'24"	2537675	727994	50.3	61.2	7.16	-102	24.4	104.8	0.60	0.28	
41	2002/2/2	SS-MD-04-41	22 55'54"	89 13'24"	2537662	727936	51.8	71.3	7.21	-109	24.5	97.7	0.60		
42	2002/2/2	SS-MD-04-42	22 55'59"	89 13'24"	2537842	728006	51.8	52.2	7.60	-110	24.5	96.7	0.50		
43	2002/2/2	SS-MD-04-43	22 55'57"	89 13'26"	2537769	728071	51.8	61.1	7.51	-103	24.5	103.7	0.50		
44	2002/2/2	SS-MD-04-44	22 55'56"	89 13'27"	2537748	728086	45.7	61.5	7.19	-108	24.5	98.7	0.60		
45	2002/2/2	SS-MD-04-45	22 56'00"	89 13'22"	2537869	727960	47.2	52.6	7.33	-116	24.4	90.8	0.60		
46	2002/2/2	SS-MD-04-46	22 56'58"	89 13'28"	2537805	728113	51.8	115.0	7.22	-112	25.0	94.4	0.60		
47	2002/2/2	SS-MD-04-47	22 55'52"	89 13'23"	2537622	727990	UK	109.3	7.35	-92	25.2	114.2	0.60		
48	2002/2/2	SS-MD-04-48	22 55'51"	89 13'23"	2537595	727980	44.2	75.1	7.18	-119	25.1	87.3	0.50		
49	2002/2/2	SS-MD-04-49	22 55'51"	89 13'23"	2537574	727986	47.2	61.0	7.15	-87	24.9	119.4	0.50		
50	2002/2/2	SS-MD-04-50	22 55'51"	89 13'23"	2537582	727971	44.2	62.7	6.98	-89	25.3	117.2	0.50	0.24	
51	2002/2/2	SS-MD-04-51	22 55'50"	89 13'23"	2537549	727973	47.2	54.0	7.41	-104	24.1	103.0	0.70		
52	2002/2/2	SS-MD-04-52	22 55'51"	89 13'22"	2537579	727952	UK	116.5	7.07	-102	24.9	104.4	0.70		
53	2002/2/2	SS-MD-04-53	22 55'52"	89 13'21"	2537618	727922	42.7	115.1	7.09	-117	24.7	89.6	0.70		
54	2002/2/2	SS-MD-04-54	22 55'50"	89 13'20"	2537554	727890	47.2	120.4	7.33	-133	25.2	73.2	0.70		
55	2002/2/2	SS-MD-04-55	22 55'51"	89 13'17"	2537573	727807	47.2	115.7	7.56	-134	24.6	72.7	0.60		
56	2002/2/2	SS-MD-04-56	22 55'51"	89 13'25"	2537585	728049	61.0	122.1	7.17	-108	25.3	98.2	0.60		
57	2002/2/3	SS-MD-04-57	22 56'47"	89 13'29"	2537482	728142	70.1	127.4	6.92	-109	25.6	96.9	0.60		
58	2002/2/3	SS-MD-04-58	22 55'49"	89 13'27"	2537520	728102	57.9	122.2	7.10	-106	25.1	100.3	0.50		
59	2002/2/3	SS-MD-04-59	22 55'49"	89 13'23"	2537533	727990	51.8	108.7	7.30	-110	25.0	96.4	0.30		
60	2002/2/3	SS-MD-04-60	22 55'49"	89 13'16"	2537507	727775	56.4	119.1	7.14	-116	25.0	90.4	0.50	0.31	
61	2002/2/3	SS-MD-04-61	22 55'49"	89 13'16"	2537534	727784	UK	109.7	7.02	-114	24.9	92.4	0.60		
62	2002/2/3	SS-MD-04-62	22 55'49"	89 13'15"	2537528	727740	50.3	118.0	7.02	-106	24.8	100.5	0.50		
63	2002/2/3	SS-MD-04-63	22 55'42"	89 13'22"	2537303	727952	42.7	123.7	7.13	-115	25.2	91.2	0.50		

Table 3.2.13 Results of Screening Survey (Madhyakul: No.1 to No.253)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
64	2002/2/3	SS-MD-04-64	22 55'41"	89 13'23"	2537287	727972	42.7	151.3	6.90	-126	25.3	80.2	0.60		
65	2002/2/4	SS-MD-04-65	22 55'39"	89 13'21"	2537227	727934	UK								Unused
66	2002/2/4	SS-MD-04-66	22 55'38"	89 13'21"	2537171	727920	UK	124.9	6.87	-98	24.9	108.4	0.70		
67	2002/2/4	SS-MD-04-67	22 55'37"	89 13'22"	2537167	727967	61.0	123.4	6.93	-111	25.4	95.1	0.50		
68	2002/2/4	SS-MD-04-68	22 55'37"	89 13'23"	2537160	727988	UK	132.3	7.07	-103	24.9	103.4	0.50		
69	2002/2/4	SS-MD-04-69	22 55'38"	89 13'24"	2537165	728017	57.9	119.3	7.28	-113	25.0	93.4	0.70		
70	2002/2/4	SS-MD-04-70	22 55'34"	89 13'30"	2537060	728196	51.8	123.1	7.12	-121	25.3	85.2	0.50	0.39	
71	2002/2/4	SS-MD-04-71	22 55'33"	89 13'31"	2537034	728203	47.2	124.7	7.10	-105	25.2	101.2	0.50		
72	2002/2/4	SS-MD-04-72	22 55'33"	89 13'29"	2537039	728170	44.8	116.9	7.17	-119	25.5	87.0	0.60		
73	2002/2/4	SS-MD-04-73	22 55'29"	89 13'28"	2536900	728124	42.7	125.2	7.06	-97	25.0	109.4	0.60		
74	2002/2/4	SS-MD-04-74	22 55'28"	89 13'26"	2536866	728088	56.4	123.4	7.13	-119	25.1	87.3	0.60		
75	2002/2/4	SS-MD-04-75	22 55'28"	89 13'26"	2536890	728060	42.7	110.5	7.09	-110	25.0	96.4	0.50		
76	2002/2/4	SS-MD-04-76	22 55'29"	89 13'32"	2536920	728236	51.8	103.2	7.18	-106	25.2	100.2	0.60		
77	2002/2/4	SS-MD-04-77	22 55'25"	89 13'34"	2536800	728302	47.2	101.2	7.10	-83	24.9	123.4	0.60		
78	2002/2/4	SS-MD-04-78	22 55'25"	89 13'33"	2536761	728294	64.0	116.2	7.18	-93	24.2	113.9	0.50		
79	2002/2/4	SS-MD-04-79	22 55'22"	89 13'27"	2536692	728094	51.8	106.3	7.14	-107	23.3	100.6	0.40		
80	2002/2/4	SS-MD-04-80	22 55'25"	89 13'29"	2536790	728155	38.1	139.0	6.93	-121	25.0	85.4	0.40	0.27	
81	2002/2/5	SS-MD-04-81	22 55'30"	89 13'18"	2536937	727851	42.7	124.6	6.90	-115	25.0	91.4	0.40		
82	2002/2/5	SS-MD-04-82	22 55'31"	89 13'19"	2536961	727868	47.2	114.8	6.91	-105	23.5	102.4	0.50		
83	2002/2/5	SS-MD-04-83	22 55'30"	89 13'23"	2536952	727988	47.2	119.8	7.11	-117	24.4	89.8	0.60		
84	2002/2/5	SS-MD-04-84	22 55'26"	89 13'12"	2536798	727680	51.8	121.7	7.05	-89	25.6	116.9	0.50		
85	2002/2/5	SS-MD-04-85	22 55'26"	89 13'11"	2536822	727658	62.5	120.9	7.40	-124	25.7	81.9	0.50		
86	2002/2/5	SS-MD-04-86	22 55'26"	89 13'11"	2536798	727628	48.8	121.3	7.19	-104	24.1	103.0	0.40		
87	2002/2/5	SS-MD-04-87	22 55'24"	89 13'12"	2536765	727661	45.7	101.3	7.17	-117	24.8	89.5	0.40		
88	2002/2/5	SS-MD-04-88	22 55'25"	89 13'09"	2536775	727595	42.7	93.3	7.20	-108	24.9	98.4	0.40		
89	2002/2/5	SS-MD-04-89	22 56'17"	89 13'10"	2536522	727607	74.7	118.2	7.06	-106	25.2	100.2	0.50		
90	2002/2/5	SS-MD-04-90	22 55'17"	89 13'10"	2536537	727620	56.4	124.0	7.21	-79	25.4	127.1	0.50	0.31	
91	2002/2/5	SS-MD-04-91	22 55'18"	89 13'12"	2536556	727687	56.4	84.0	7.14	-108	24.4	98.8	0.60		
92	2002/2/5	SS-MD-04-92	22 55'15"	89 13'13"	2536460	727702	56.4	128.7	7.26	-101	25.7	104.9	0.50		
93	2002/2/5	SS-MD-04-93	22 55'14"	89 13'13"	2536456	727719	59.4	118.5	7.08	-109	25.3	97.2	0.60		
94	2002/2/5	SS-MD-04-94	22 55'14"	89 13'12"	2536458	727681	UK	128.5	7.13	-112	24.2	94.9	0.60		
95	2002/2/5	SS-MD-04-95	22 55'14"	89 13'12"	2536442	727674	47.2	177.7	7.35	-102	25.4	104.1	0.50		
96	2002/2/5	SS-MD-04-96	22 55'14"	89 13'13"	2536434	727715	UK	193.3	7.10	-103	25.2	103.2	0.50		
97	2002/2/5	SS-MD-04-97	22 55'15"	89 13'14"	2536446	727752	65.5	102.5	7.27	-114	25.0	92.4	0.50		
98	2002/2/5	SS-MD-04-98	22 55'15"	89 13'15"	2536478	727769	33.5	122.9	7.28	-91	25.3	115.2	0.60		
99	2002/2/5	SS-MD-04-99	22 55'14"	89 13'17"	2536455	727829	42.7	94.5	7.20	-109	25.2	97.2	0.60		
100	2002/2/5	SS-MD-04-100	22 55'16"	89 13'18"	2536505	727848	UK	119.3	7.19	-97	24.8	109.5	0.50	0.29	
101	2002/2/5	SS-MD-04-101	22 55'16"	89 13'19"	2536501	727882	51.8	74.5	7.19	-85	25.0	121.4	0.50		
102	2002/2/6	SS-MD-04-102	22 55'22"	89 13'36"	2536691	728349	51.8	78.9	7.02	-102	25.1	104.3	0.60		
103	2002/2/6	SS-MD-04-103	22 55'21"	89 13'35"	2536657	728322	UK	115.6	6.95	-98	25.2	108.2	0.50		
104	2002/2/6	SS-MD-04-104	22 55'21"	89 13'33"	2536673	728284	UK	119.2	7.07	-101	24.8	105.5	0.60		
105	2002/2/6	SS-MD-04-105	22 55'19"	89 13'35"	2536612	728342	47.2	126.0	7.07	-110	24.6	96.7	0.50		
106	2002/2/6	SS-MD-04-106	22 55'19"	89 13'33"	2536608	728289	65.5	120.0	7.07	-113	25.1	93.3	0.40		
107	2002/2/6	SS-MD-04-107	22 55'16"	89 13'33"	2536509	728285	53.3	119.4	7.31	-117	25.0	89.4	0.50		
108	2002/2/6	SS-MD-04-108	22 55'14"	89 13'34"	2536470	728305	UK	127.3	7.48	-112	24.5	94.7	0.50		
109	2002/2/6	SS-MD-04-109	22 55'12"	89 13'31"	2536390	728249	51.8	122.3	7.14	-128	25.0	78.4	0.50		
110	2002/2/6	SS-MD-04-110	22 55'11"	89 13'29"	2536368	728177	51.8	126.1	7.17	-127	25.0	79.4	0.40	0.36	
111	2002/2/6	SS-MD-04-111	22 55'10"	89 13'30"	2536340	728197	53.3	128.4	7.10	-117	25.3	89.2	0.60		
112	2002/2/6	SS-MD-04-112	22 55'10"	89 13'28"	2536331	728120	56.4	125.3	7.09	-127	25.0	79.4	0.60		
113	2002/2/6	SS-MD-04-113	22 55'14"	89 13'24"	2536466	728027	47.2	124.1	7.42	-124	25.1	82.3	0.70		
114	2002/2/6	SS-MD-04-114	22 55'09"	89 13'26"	2536314	728086	47.2	109.5	7.20	-115	25.5	91.0	0.60		
115	2002/2/6	SS-MD-04-115	22 55'10"	89 13'26"	2536369	728073	UK	126.5	7.30	-134	25.1	72.3	0.60		
116	2002/2/6	SS-MD-04-116	22 55'07"	89 13'24"	2536238	728017	61.0	121.2	7.42	-127	25.1	79.3	0.50		
117	2002/2/6	SS-MD-04-117	22 55'08"	89 13'24"	2536252	728015	56.4	126.2	7.22	-128	24.4	78.8	0.40		
118	2002/2/7	SS-MD-04-118	22 55'08"	89 13'21"	2536269	727931	51.8	113.7	7.03	-125	25.6	80.9	0.50		
119	2002/2/7	SS-MD-04-119	22 55'07"	89 13'21"	2536226	727927	51.8	86.3	7.05	-130	25.0	76.4	0.60		
120	2002/2/7	SS-MD-04-120	22 55'07"	89 13'21"	2536234	727942	51.8	98.3	7.18	-120	25.3	86.2	0.60	0.34	
121	2002/2/7	SS-MD-04-121	22 55'06"	89 13'23"	2536189	728004	57.9	109.1	7.14	-134	25.1	72.3	0.50		
122	2002/2/7	SS-MD-04-122	22 55'06"	89 13'23"	2536200	728012	UK	120.6	7.17	-133	24.9	73.4	0.50		
123	2002/2/7	SS-MD-04-123	22 55'06"	89 13'18"	2536192	727866	51.8	126.0	7.16	-138	25.3	68.2	0.50		
124	2002/2/7	SS-MD-04-124	22 55'06"	89 13'19"	2536194	727886	57.9	105.7	7.46	-111	25.7	94.9	0.50		
125	2002/2/7	SS-MD-04-125	22 55'04"	89 13'17"	2536153	727817	UK								Unused
126	2002/2/7	SS-MD-04-126	22 55'04"	89 13'18"	2536143	727864	51.8	120.7	7.08	-104	25.6	101.9	0.50		

Table 3.2.13 Results of Screening Survey (Madhyakul: No.1 to No.253)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
127	2002/2/7	SS-MD-04-127	22 55'04"	89 13'15"	2536147	727786	UK	122.5	7.10	-135	25.7	70.9	0.50		
128	2002/2/7	SS-MD-04-128	22 55'06"	89 13'15"	2536184	727765	56.4	121.3	7.36	-139	25.3	67.2	0.40		
129	2002/2/7	SS-MD-04-129	22 55'02"	89 13'18"	2536184	727848	47.2	127.3	7.38	-122	25.8	83.8	0.40		
130	2002/2/7	SS-MD-04-130	22 55'04"	89 13'15"	2536140	727766	UK	116.9	7.14	-138	25.7	67.9	0.30	0.30	
131	2002/2/7	SS-MD-04-131	22 55'02"	89 13'17"	2536080	727823	47.2	123.8	7.29	-139	25.2	67.2	0.40		
132	2002/2/7	SS-MD-04-132	22 55'02"	89 13'15"	2536078	727774	38.1	128.1	7.15	-140	25.9	65.7	0.40		
133	2002/2/7	SS-MD-04-133	22 55'01"	89 13'15"	2536046	727782	65.5	102.3	7.31	-135	25.7	70.9	0.40		
134	2002/2/10	SS-MD-04-134	22 55'00"	89 13'09"	2536004	727589	51.8	103.4	7.11	-94	25.6	111.9	0.50		
135	2002/2/10	SS-MD-04-135	22 54'59"	89 13'11"	2535994	727649	47.2	125.8	6.98	-96	26.0	109.6	0.50		
136	2002/2/10	SS-MD-04-136	22 55'00"	89 13'11"	2536001	727662	51.8	126.9	7.02	-102	25.8	103.8	0.60		
137	2002/2/10	SS-MD-04-137	22 54'59"	89 13'12"	2535992	727694	54.9	89.5	7.27	-125	25.6	80.9	0.40		
138	2002/2/10	SS-MD-04-138	22 55'00"	89 13'13"	2536013	727721	UK	127.0	7.02	-102	25.4	104.1	0.40		
139	2002/2/10	SS-MD-04-139	22 54'57"	89 13'10"	2535932	727622	57.9	107.9	7.25	-112	25.9	93.7	0.50		
140	2002/2/10	SS-MD-04-140	22 54'57"	89 13'08"	2535933	727563	51.8	117.7	7.23	-112	25.6	93.9	0.50	0.29	
141	2002/2/10	SS-MD-04-141	22 54'57"	89 13'08"	2535913	727566	51.8	104.7	7.37	-133	25.9	72.7	0.40		
142	2002/2/10	SS-MD-04-142	22 54'56"	89 13'09"	2535903	727614	56.4	110.3	7.31	-120	25.7	85.9	0.40		
143	2002/2/10	SS-MD-04-143	22 54'56"	89 13'11"	2535887	727662	51.8	111.3	7.27	-122	25.6	83.9	0.50		
144	2002/2/10	SS-MD-04-144	22 54'54"	89 13'11"	2535835	727677	48.8	127.4	7.29	-120	25.8	85.8	0.50		
145	2002/2/10	SS-MD-04-145	22 54'55"	89 13'12"	2535864	727695	51.8	122.3	7.10	-122	25.1	84.3	0.40		
146	2002/2/10	SS-MD-04-146	22 54'56"	89 13'12"	2535874	727688	47.2	126.8	7.22	-107	25.6	98.9	0.40		
147	2002/2/10	SS-MD-04-147	22 54'55"	89 13'13"	2535857	727726	UK	130.7	7.14	-118	25.8	87.8	0.40		
148	2002/2/10	SS-MD-04-148	22 54'53"	89 13'13"	2535792	727723	19.8	134.1	7.05	-107	26.1	98.6	0.40		
149	2002/2/10	SS-MD-04-149	22 54'53"	89 13'13"	2535797	727707	48.8	107.7	7.10	-122	25.9	83.7	0.40		
150	2002/2/10	SS-MD-04-150	22 54'54"	89 13'13"	2535816	727670	56.4	109.6	7.18	-127	26.0	78.6	0.50	0.29	
151	2002/2/10	SS-MD-04-151	22 54'52"	89 13'11"	2535760	727671	56.4	114.6	7.19	-128	25.6	77.9	0.50		
152	2002/2/10	SS-MD-04-152	22 54'54"	89 13'11"	2535843	727660	56.4	113.5	7.24	-132	25.7	73.9	0.40		
153	2002/2/10	SS-MD-04-153	22 54'54"	89 13'08"	2535838	727569	65.5	105.6	7.15	-109	26.1	96.6	0.50		
154	2002/2/10	SS-MD-04-154	22 54'55"	89 13'09"	2535850	727597	42.7	108.3	7.21	-128	25.9	77.7	0.50		
155	2002/2/10	SS-MD-04-155	22 54'50"	89 13'11"	2535690	727668	54.9	87.4	7.11	-105	25.6	100.9	0.40		
156	2002/2/10	SS-MD-04-156	22 54'49"	89 13'11"	2535692	727657	50.3	92.3	7.17	-115	25.2	91.2	0.50		
157	2002/2/10	SS-MD-04-157	22 54'48"	89 13'11"	2535648	727685	44.2	120.7	7.10	-123	25.0	83.4	0.50		
158	2002/2/10	SS-MD-04-158	22 54'48"	89 13'11"	2535648	727647	61.0	108.7	7.18	-123	25.8	82.8	0.50		
159	2002/2/10	SS-MD-04-159	22 54'48"	89 13'12"	2535625	727717	65.5	101.3	7.46	-113	25.6	92.5	0.60		
160	2002/2/11	SS-MD-04-160	22 54'47"	89 13'12"	2535595	727707	UK	103.8	7.01	-107	25.2	99.2	0.40	0.27	
161	2002/2/11	SS-MD-04-161	22 54'47"	89 13'11"	2535612	727682	UK	106.1	7.17	-98	24.9	108.4	0.30		
162	2002/2/11	SS-MD-04-162	22 54'45"	89 13'12"	2535558	727706	UK	110.3	7.17	-104	25.6	101.9	0.70		
163	2002/2/11	SS-MD-04-163	22 54'46"	89 13'13"	2535584	727715	51.8	90.9	7.15	-99	25.9	106.7	0.80		
164	2002/2/11	SS-MD-04-164	22 54'46"	89 13'11"	2535575	727660	UK	87.8	7.15	-115	25.9	90.7	0.90		
165	2002/2/11	SS-MD-04-165	22 54'45"	89 13'10"	2535561	727649	UK	95.5	7.12	-119	26.1	86.6	0.60		
166	2002/2/11	SS-MD-04-166	22 54'45"	89 13'11"	2535539	727670	48.8	114.1	7.35	-109	25.7	96.9	0.50		
167	2002/2/11	SS-MD-04-167	22 54'44"	89 13'12"	2535535	727702	51.8	115.1	7.23	-118	26.1	87.6	0.60		
168	2002/2/11	SS-MD-04-168	22 54'44"	89 13'11"	2535510	727686	UK	97.3	7.51	-113	26.1	92.6	0.60		
169	2002/2/11	SS-MD-04-169	22 54'44"	89 13'11"	2535505	727675	56.4	106.0	7.28	-102	25.8	103.8	0.50		
170	2002/2/11	SS-MD-04-170	22 54'43"	89 13'11"	2535492	727724	51.8	98.2	7.18	-106	25.8	99.8	0.50	0.27	
171	2002/2/11	SS-MD-04-171	22 54'43"	89 13'13"	2535484	727633	UK	113.6	7.19	-103	25.7	102.9	0.50		
172	2002/2/11	SS-MD-04-172	22 54'42"	89 13'13"	2535459	727722	45.7	116.8	7.15	-117	25.6	88.9	0.50		
173	2002/2/11	SS-MD-04-173	22 54'42"	89 13'14"	2535457	727743	UK	118.5	7.33	-103	25.6	102.9	0.50		
174	2002/2/11	SS-MD-04-174	22 54'42"	89 13'15"	2535460	727777	65.5	97.3	7.24	-125	25.7	80.9	0.60		
175	2002/2/11	SS-MD-04-175	22 54'41"	89 13'14"	2535439	727762	UK	106.4	7.26	-126	25.7	79.9	0.50		
176	2002/2/11	SS-MD-04-176	22 54'42"	89 13'15"	2535455	727769	UK	120.3	7.27	-125	25.6	80.9	0.60		
177	2002/2/12	SS-MD-04-177	22 54'41"	89 13'13"	2535416	727735	UK	111.3	7.15	-98	25.5	108.0	0.50		
178	2002/2/12	SS-MD-04-178	22 54'40"	89 13'13"	2535407	727728	56.4	112.1	7.49	-106	25.1	100.3	0.60		
179	2002/2/12	SS-MD-04-179	22 54'40"	89 13'15"	2535412	727777	57.9	105.3	7.20	-122	25.3	84.2	0.50		
180	2002/2/12	SS-MD-04-180	22 54'41"	89 13'15"	2535418	727777	38.1	113.2	7.10	-105	25.3	101.2	0.60	0.20	
181	2002/2/12	SS-MD-04-181	22 54'41"	89 13'15"	2535423	727798	56.4	111.7	7.11	-117	25.3	89.2	0.50		
182	2002/2/12	SS-MD-04-182	22 54'40"	89 13'14"	2535386	727854	56.4	112.3	7.30	-119	24.6	87.7	0.50		
183	2002/2/12	SS-MD-04-183	22 54'39"	89 13'14"	2535371	727762	UK	103.6	7.61	-102	25.6	103.9	0.60		
184	2002/2/12	SS-MD-04-184	22 54'39"	89 13'14"	2535374	727751	UK	98.3	7.23	-107	26.0	98.6	0.60		
185	2002/2/12	SS-MD-04-185	22 54'39"	89 13'13"	2535364	727723	47.2	107.3	7.33	-97	25.8	108.8	0.50		
186	2002/2/12	SS-MD-04-186	22 54'39"	89 13'13"	2535358	727728	51.8	102.3	7.51	-103	26.1	102.6	0.60		
187	2002/2/12	SS-MD-04-187	22 54'58"	89 13'01"	2535958	727380	47.2	108.9	7.52	-93	26.0	112.6	0.70		
188	2002/2/12	SS-MD-04-188	22 54'58"	89 13'03"	2535949	727433	UK	104.3	7.19	-116	26.2	89.5	0.60		
189	2002/2/12	SS-MD-04-189	22 54'56"	89 13'05"	2535890	727498	38.1	115.3	7.22	-126	25.8	79.8	0.50		

Table 3.2.13 Results of Screening Survey (Madhyakul: No.1 to No.253)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
190	2002/2/12	SS-MD-04-190	22 54'56"	89 13'05"	2535903	727467	47.2	86.2	7.23	-123	26.0	82.6	0.50	0.25	
191	2002/2/12	SS-MD-04-191	22 54'52"	89 13'08"	2535775	727577	51.8	97.3	7.21	-122	26.1	83.6	0.60		
192	2002/2/12	SS-MD-04-192	22 54'51"	89 13'07"	2535739	727560	61.0	71.2	7.36	-103	26.1	102.6	0.70		
193	2002/2/12	SS-MD-04-193	22 54'49"	89 13'09"	2535681	727698	UK	106.8	7.26	-117	25.7	88.9	0.50		
194	2002/2/12	SS-MD-04-194	22 54'48"	89 13'09"	2535632	727619	47.2	95.3	7.45	-103	24.5	103.7	0.50		
195	2002/2/13	SS-MD-04-195	22 55'00"	89 13'01"	2536001	727386	UK	108.7	7.06	-117	25.7	88.9	0.60		
196	2002/2/13	SS-MD-04-196	22 55'00"	89 13'01"	2536014	727376	51.8	110.3	7.22	-113	25.5	93.0	0.50		
197	2002/2/13	SS-MD-04-197	22 55'00"	89 13'00"	2536000	727346	51.8	93.7	7.16	-123	25.5	83.0	0.60		
198	2002/2/13	SS-MD-04-198	22 55'00"	89 13'59"	2536014	727333	UK	110.3	7.11	-125	25.4	81.1	0.50		
199	2002/2/13	SS-MD-04-199	22 55'03"	89 13'00"	2536096	727357	33.5	117.9	7.32	-104	25.0	102.4	0.50		
200	2002/2/13	SS-MD-04-200	22 55'01"	89 13'00"	2536032	727350	51.8	89.3	7.30	-121	24.8	85.5	0.60	0.33	
201	2002/2/13	SS-MD-04-201	22 55'02"	89 13'59"	2536078	727320	57.9	98.3	7.30	-107	25.6	98.9	0.50		
202	2002/2/13	SS-MD-04-202	22 55'02"	89 13'59"	2536062	727322	UK	117.1	7.15	-123	25.9	82.7	0.60		
203	2002/2/13	SS-MD-04-203	22 55'03"	89 13'57"	2536110	727280	51.8	71.3	7.60	-103	26.2	102.5	0.50		
204	2002/2/13	SS-MD-04-204	22 55'04"	89 13'58"	2536137	727284	46.3	103.4	7.33	-97	25.5	109.0	0.40		
205	2002/2/13	SS-MD-04-205	22 55'04"	89 13'56"	2536144	727243	51.8	87.3	7.51	-93	25.5	113.0	0.50		
206	2002/2/13	SS-MD-04-206	22 55'05"	89 13'58"	2536165	727290	UK	73.3	7.49	-104	25.7	101.9	0.50		
207	2002/2/13	SS-MD-04-207	22 55'07"	89 13'58"	2536227	727284	56.4	101.3	7.23	-127	25.9	78.7	0.50		
208	2002/2/13	SS-MD-04-208	22 55'08"	89 13'56"	2536232	727241	53.3	113.3	7.45	-113	26.0	92.6	0.50		
209	2002/2/13	SS-MD-04-209	22 55'07"	89 13'56"	2536235	727228	51.8	117.4	7.26	-122	25.9	83.7	0.40		
210	2002/2/13	SS-MD-04-210	22 55'12"	89 13'06"	2536293	727514	UK	114.1	7.23	-121	26.0	84.6	0.60	0.33	
211	2002/2/13	SS-MD-04-211	22 55'14"	89 13'06"	2536241	727522	51.8	119.3	7.24	-108	26.1	97.6	0.50		
212	2002/2/13	SS-MD-04-212	22 55'22"	89 13'06"	2536690	727517	51.8	124.6	7.34	-103	26.3	102.4	0.50		
213	2002/2/13	SS-MD-04-213	22 55'23"	89 13'06"	2536728	727519	42.7	114.3	7.29	-101	26.1	104.6	0.50		
214	2002/2/13	SS-MD-04-214	22 55'24"	89 13'07"	2536753	727538	54.9	96.3	7.37	-99	26.2	106.5	0.50		
215	2002/2/13	SS-MD-04-215	22 55'25"	89 13'07"	2536778	727546	51.8	109.2	7.36	-107	25.9	98.7	0.50		
216	2002/2/13	SS-MD-04-216	22 55'31"	89 13'04"	2536977	727438	51.8	101.3	7.32	-101	25.6	104.9	0.50		
217	2002/2/13	SS-MD-04-217	22 55'31"	89 13'03"	2536981	727428	51.8	109.2	7.24	-113	25.6	92.9	0.50		
218	2002/2/13	SS-MD-04-218	22 55'34"	89 13'03"	2537045	727422	UK	89.3	7.31	-109	25.8	96.8	0.50		
219	2002/2/13	SS-MD-04-219	22 55'33"	89 13'03"	2537014	727405	UK	105.2	7.44	-103	25.5	103.0	0.40		
220	2002/2/14	SS-MD-04-220	22 55'31"	89 12'56"	2536970	727220	51.8	103.3	7.21	-107	25.5	99.0	0.50	0.29	
221	2002/2/14	SS-MD-04-221	22 55'32"	89 12'57"	2536979	727251	56.4	177.2	7.21	-113	25.2	93.2	0.50		
222	2002/2/14	SS-MD-04-222	22 55'33"	89 12'56"	2537035	727212	UK	116.3	7.28	-98	25.3	108.2	0.50		
223	2002/2/14	SS-MD-04-223	22 55'31"	89 12'56"	2536956	727220	47.2	107.3	7.30	-126	25.8	79.8	0.50		
224	2002/2/14	SS-MD-04-224	22 55'30"	89 12'57"	2536938	727242	48.8	118.3	7.33	-118	25.4	88.1	0.60		
225	2002/2/14	SS-MD-04-225	22 55'30"	89 12'57"	2536937	727249	51.8	109.3	7.25	-123	25.1	83.3	0.50		
226	2002/2/14	SS-MD-04-226	22 55'30"	89 12'58"	2536924	727262	UK	97.3	7.32	-116	25.9	89.7	0.60		
227	2002/2/14	SS-MD-04-227	22 55'32"	89 12'58"	2536996	727282	53.3	106.6	7.48	-119	25.5	87.0	0.60		
228	2002/2/14	SS-MD-04-228	22 55'48"	89 13'12"	2537489	727662	56.4	116.3	7.25	-113	24.9	93.4	0.50		
229	2002/2/14	SS-MD-04-229	22 55'48"	89 13'11"	2537484	727623	56.4	108.1	7.30	-103	24.7	103.6	0.40		
230	2002/2/14	SS-MD-04-230	22 55'50"	89 13'10"	2537545	727613	51.8	117.1	7.22	-107	24.9	99.4	0.50	0.33	
231	2002/2/14	SS-MD-04-231	22 55'52"	89 13'07"	2537622	727519	47.2	115.3	7.19	-106	24.8	100.5	0.60		
232	2002/2/14	SS-MD-04-232	22 55'52"	89 13'07"	2537606	727519	UK	117.2	7.53	-103	25.1	103.3	0.50		
233	2002/2/14	SS-MD-04-233	22 55'51"	89 13'08"	2537572	727553	UK	97.2	7.45	-119	25.0	87.4	0.50		
234	2002/2/14	SS-MD-04-234	22 55'50"	89 13'08"	2537559	727550	42.7	109.3	7.32	-113	25.2	93.2	0.40		
235	2002/2/14	SS-MD-04-235	22 55'51"	89 13'12"	2537568	727684	51.8	98.3	7.23	-117	24.9	89.4	0.50		
236	2002/2/14	SS-MD-04-236	22 55'51"	89 13'10"	2537584	727610	47.2	116.1	7.47	-108	25.3	98.2	0.40		
237	2002/2/14	SS-MD-04-237	22 55'51"	89 13'11"	2537582	727628	UK	115.3	7.62	-115	24.9	91.4	0.40		
238	2002/2/14	SS-MD-04-238	22 55'52"	89 13'11"	2537600	727632	UK	94.3	7.32	-105	24.8	101.5	0.50		
239	2002/2/14	SS-MD-04-239	22 55'52"	89 13'12"	2537601	727665	47.2	116.3	7.33	-118	25.6	87.9	0.60		
240	2002/2/14	SS-MD-04-240	22 55'50"	89 13'09"	2537552	727581	47.2	98.3	7.38	-115	24.5	91.7	0.50	0.36	
241	2002/2/14	SS-MD-04-241	22 55'57"	89 13'15"	2537777	727747	32.0	112.2	7.22	-110	25.2	96.2	0.40		
242	2002/2/14	SS-MD-04-242	22 55'58"	89 13'15"	2537788	727740	32.0	109.3	7.47	-101	25.1	105.3	0.50		
243	2002/2/14	SS-MD-04-243	22 55'58"	89 13'15"	2537792	727741	32.0	96.3	7.25	-119	25.9	86.7	0.50		
244	2002/2/14	SS-MD-04-244	22 55'58"	89 13'14"	2537795	727711	UK	113.8	7.24	-105	25.9	100.7	0.50		
245	2002/2/14	SS-MD-04-245	22 55'58"	89 13'12"	2537781	727667	47.2	111.3	7.40	-97	25.8	108.8	0.50		
246	2002/2/14	SS-MD-04-246	22 55'56"	89 13'13"	2537742	727680	41.1	103.3	7.28	-101	26.0	104.6	0.60		
247	2002/2/14	SS-MD-04-247	22 56'34"	89 13'33"	2538904	728239	30.5	93.3	7.35	-97	25.6	108.9	0.50		
248	2002/2/16	SS-MD-04-248	22 56'22"	89 13'26"	2538528	728052	73.2	87.2	7.44	-103	24.7	103.6	0.40		
249	2002/2/16	SS-MD-04-249	22 56'22"	89 13'25"	2538529	728022	56.4	93.7	7.27	-98	24.3	108.9	0.40		
250	2002/2/16	SS-MD-04-250	22 56'22"	89 13'26"	2538528	728042	47.2	90.3	7.22	-93	25.0	113.4	0.50	0.21	
251	2002/2/16	SS-MD-04-251	22 56'20"	89 13'24"	2538469	727984	UK	111.3	7.15	-99	24.7	107.6	0.50		
252	2002/2/14	SS-MD-04-252	22 56'19"	89 13'24"	2538452	728001	42.7	110.3	7.19	-94	24.9	112.4	0.60		
253	2002/2/16	SS-MD-04-253	22 54'59"	89 14'04"	2535986	727524	62.5	107.9	7.66	-107	25.5	99.0	0.50	0.25	

Table 3.2.14 Results of Screening Survey (Habaspol: No.1 to No.56)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/2/4	SS-HB-01-01	22 55'30"	89 12'23"	2536903	726274	UK	106.5	7.01	-104	24.7	102.6	0.30		
2	2002/2/4	SS-HB-01-02	22 55'28"	89 12'24"	2536863	726300	45.7	103.3	7.09	-102	24.2	104.9	0.40		
3	2002/2/4	SS-HB-01-03	22 55'27"	89 12'25"	2536830	726333	76.2	112.3	6.97	-109	24.9	97.4	0.40		
4	2002/2/4	SS-HB-01-04	22 55'27"	89 12'26"	2536822	726369	79.2	98.2	7.00	-112	24.9	94.4	0.30		
5	2002/2/4	SS-HB-01-05	22 55'26"	89 12'25"	2536790	726344	UK	109.2	7.11	-109	24.7	97.6	0.50		
6	2002/2/4	SS-HB-01-06	22 55'26"	89 12'27"	2536790	726387	UK	108.6	7.02	-110	25.1	96.3	0.50		
7	2002/2/4	SS-HB-01-07	22 55'27"	89 12'27"	2536814	726394	61.0	91.8	7.06	-114	24.6	92.7	0.50		
8	2002/2/4	SS-HB-01-08	22 55'29"	89 12'27"	2536877	726390	64.0	100.6	7.03	-115	24.6	91.7	0.40		
9	2002/2/4	SS-HB-01-09	22 55'30"	89 12'27"	2536916	726348	35.1	108.6	7.01	-117	24.9	89.4	0.40		
10	2002/2/4	SS-HB-01-10	22 55'27"	89 12'33"	2536812	726551	UK	101.2	7.01	-122	25.2	84.2	0.40	0.26	
11	2002/2/4	SS-HB-01-11	22 55'25"	89 12'32"	2536774	726527	41.1	113.5	7.11	-118	25.0	88.4	0.40		
12	2002/2/4	SS-HB-01-12	22 55'26"	89 12'30"	2536794	726486	48.8	102.7	7.03	-106	24.8	100.5	0.30		
13	2002/2/4	SS-HB-01-13	22 55'27"	89 12'30"	2536827	726488	UK	109.2	7.05	-122	24.3	84.9	0.40		
14	2002/2/4	SS-HB-01-14	22 55'32"	89 12'24"	2536980	726306	UK	112.7	7.02	-107	24.9	99.4	0.50		
15	2002/2/4	SS-HB-01-15	22 55'33"	89 12'28"	2537005	726426	UK	104.2	7.10	-109	25.1	97.3	0.50		
16	2002/2/5	SS-HB-01-16	22 55'36"	89 12'31"	2537097	726487	61.0	100.4	7.09	-106	24.2	100.9	0.40		
17	2002/2/5	SS-HB-01-17	22 55'35"	89 12'31"	2537068	726498	UK	101.2	7.02	-102	25.1	104.3	0.50		
18	2002/2/4	SS-HB-01-18	22 55'34"	89 12'32"	2537081	726527	UK								Unused
19	2002/2/4	SS-HB-01-19	22 55'34"	89 12'33"	2537044	726571	42.7	109.2	7.04	-101	24.4	105.8	0.50		
20	2002/2/5	SS-HB-01-20	22 55'37"	89 12'34"	2537139	726597	36.6	106.3	7.05	-112	23.7	95.3	0.50	0.24	
21	2002/2/5	SS-HB-01-21	22 55'41"	89 12'35"	2537261	726606	UK	101.2	7.03	-107	24.6	99.7	0.50		
22	2002/2/5	SS-HB-01-22	22 55'41"	89 12'33"	2537263	726556	33.5	103.6	7.09	-102	24.7	104.6	0.60		
23	2002/2/5	SS-HB-01-23	22 55'42"	89 12'34"	2537288	726585	61.0	102.0	7.04	-109	24.6	97.7	0.40		
24	2002/2/5	SS-HB-01-24	22 55'42"	89 12'33"	2537300	726557	45.7	101.4	7.06	-107	24.9	99.4	0.40		
25	2002/2/5	SS-HB-01-25	22 55'43"	89 12'36"	2537332	726631	UK	105.3	7.10	-111	25.1	95.3	0.40		
26	2002/2/5	SS-HB-01-26	22 55'42"	89 12'36"	2537287	726641	38.1	106.2	7.07	-109	24.6	97.7	0.40		
27	2002/2/5	SS-HB-01-27	22 55'40"	89 12'32"	2537228	726539	UK	102.0	7.03	-105	24.5	101.7	0.50		
28	2002/2/5	SS-HB-01-28	22 55'39"	89 12'33"	2537206	726545	UK	102.5	7.04	-107	24.8	99.5	0.50		
29	2002/2/5	SS-HB-01-29	22 55'38"	89 12'31"	2537151	726516	UK	100.6	7.02	-101	25.0	105.4	0.30		
30	2002/2/5	SS-HB-01-30	22 55'39"	89 12'31"	2537192	726499	UK	103.4	7.02	-110	24.0	97.1	0.40	0.29	
31	2002/2/5	SS-HB-01-31	22 55'34"	89 12'40"	2537047	726749	UK	100.3	7.07	-107	24.8	99.5	0.40		
32	2002/2/5	SS-HB-01-32	22 55'33"	89 12'39"	2537022	726725	51.8	117.2	7.03	-102	24.5	104.7	0.40		
33	2002/2/5	SS-HB-01-33	22 55'32"	89 12'37"	2536997	726688	48.8	111.6	7.04	-112	25.1	94.3	0.50		
34	2002/2/5	SS-HB-01-34	22 55'31"	89 12'36"	2536952	726660	UK	120.3	6.97	-112	25.1	94.3	0.30		
35	2002/2/5	SS-HB-01-35	22 55'34"	89 12'35"	2537042	726613	UK	113.4	7.01	-106	24.1	101.0	0.30		
36	2002/2/5	SS-HB-01-36	22 55'35"	89 12'40"	2537082	726773	56.4	106.0	7.04	-100	24.8	106.5	0.50		
37	2002/2/5	SS-HB-01-37	22 55'35"	89 12'40"	2537065	726748	56.4	103.4	7.06	-113	24.6	93.7	0.40		
38	2002/2/5	SS-HB-01-38	22 55'33"	89 12'41"	2537022	726792	42.7								Unused
39	2002/2/6	SS-HB-01-39	22 55'39"	89 12'39"	2537198	726720	47.2	106.8	7.09	-110	23.9	97.2	0.40		
40	2002/2/6	SS-HB-01-40	22 55'36"	89 12'44"	2537119	726880	48.8	107.2	7.03	-92	24.7	114.6	0.40	0.25	
41	2002/2/6	SS-HB-01-41	22 55'35"	89 12'43"	2537074	726883	UK	106.1	7.07	-110	24.9	96.4	0.50		
42	2002/2/6	SS-HB-01-42	22 55'33"	89 12'43"	2537036	726850	42.7	129.9	7.06	-106	25.0	100.4	0.08	0.12	
43	2002/2/6	SS-HB-01-43	22 55'33"	89 12'46"	2537050	726924	UK	108.8	7.08	-121	25.1	85.3	0.50		
44	2002/2/6	SS-HB-01-44	22 55'35"	89 12'45"	2537087	726904	UK	105.4	7.02	-107	25.4	99.1	0.50		
45	2002/2/6	SS-HB-01-45	22 55'35"	89 12'46"	2537086	726930	42.7	109.5	7.00	-117	25.2	89.2	0.50		
46	2002/2/6	SS-HB-01-46	22 55'37"	89 12'47"	2537148	726948	51.8								Unused
47	2002/2/6	SS-HB-01-47	22 55'36"	89 12'48"	2537103	726985	UK	107.6	7.12	-97	25.2	109.2	0.50		
48	2002/2/6	SS-HB-01-48	22 55'34"	89 12'48"	2537042	726977	UK	105.7	7.14	-122	25.5	84.0	0.70		
49	2002/2/6	SS-HB-01-49	22 55'37"	89 12'50"	2537136	727056	47.2	106.6	7.12	-121	25.1	85.3	0.50		
50	2002/2/6	SS-HB-01-50	22 55'34"	89 12'53"	2537058	727127	48.8	110.0	7.08	-89	25.2	117.2	0.50	0.30	
51	2002/2/6	SS-HB-01-51	22 55'34"	89 12'53"	2537058	727127	42.7	107.1	7.03	-102	25.0	104.4	0.60		
52	2002/2/6	SS-HB-01-52	22 55'34"	89 12'54"	2537053	727172	57.9	106.9	7.14	-95	25.1	111.3	0.50		
53	2002/2/6	SS-HB-01-53	22 55'33"	89 12'53"	2537033	727125	33.5	109.0	7.05	-103	25.1	103.3	0.40		
54	2002/2/6	SS-HB-01-54	22 55'34"	89 12'52"	2537025	727114	48.8	107.6	7.01	-104	25.3	102.2	0.50		
55	2002/2/6	SS-HB-01-55	22 55'33"	89 12'52"	2537009	727091	33.5	109.4	7.05	-103	25.0	103.4	0.60		
56	2002/2/6	SS-HB-01-56	22 55'32"	89 12'51"	2536994	727076	62.5	111.2	7.06	-98	25.3	108.2	0.50	0.32	

Table 3.2.15 Results of Screening Survey (Bhagati Narendrapur: No.1 to No.367)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
1	2002/1/31	SS-BN-05-01	22 54'55"	89 12'21"	2535841	726242	50.3	56.8	7.09	-112	24.8	94.5	0.50	0.26	
2	2002/1/31	SS-BN-05-02	22 54'54"	89 12'22"	2535803	726264	45.7	62.3	7.09	-135	25.0	71.4	0.50		
3	2002/1/31	SS-BN-05-03	22 54'53"	89 12'22"	2535776	726270	36.6	62.5	7.04	-140	25.0	66.4	0.50		
4	2002/1/31	SS-BN-05-04	22 54'54"	89 12'21"	2535803	726238	41.1	104.3	7.05	-142	25.3	64.2	0.50		
5	2002/1/31	SS-BN-05-05	22 54'53"	89 12'20"	2535786	726222	36.6	101.5	7.06	-142	25.5	64.0	0.50		
6	2002/1/31	SS-BN-05-06	22 54'52"	89 12'22"	2535747	726278	36.6	52.6	6.96	-140	24.6	66.7	0.50		
7	2002/1/31	SS-BN-05-07	22 54'50"	89 12'24"	2535682	726320	30.5	98.7	7.06	-146	23.4	61.5	0.50		
8	2002/1/31	SS-BN-05-08	22 54'54"	89 12'27"	2535802	726400	36.6	56.6	7.04	-148	24.8	58.5	0.40		
9	2002/1/31	SS-BN-05-09	22 54'53"	89 12'28"	2535778	726427	36.6	76.0	7.02	-140	24.8	66.5	0.60		
10	2002/1/31	SS-BN-05-10	22 54'54"	89 12'29"	2535800	726465	50.3	75.0	7.12	-140	24.7	66.6	0.50	0.12	
11	2002/1/31	SS-BN-05-11	22 54'54"	89 12'30"	2535807	726486	47.2	76.2	7.02	-140	24.8	66.5	0.50		
12	2002/1/31	SS-BN-05-12	22 54'32"	89 12'29"	2535741	726477	30.5	86.0	6.92	-140	25.8	65.8	0.60		
13	2002/1/31	SS-BN-05-13	22 54'52"	89 12'29"	2535741	726464	30.5	93.4	6.96	-141	25.1	65.3	0.60		
14	2002/1/31	SS-BN-05-14	22 54'50"	89 12'30"	2535697	726488	30.5	90.5	7.10	-147	25.0	59.4	0.60		
15	2002/1/31	SS-BN-05-16	22 54'50"	89 12'29"	2535691	726489	30.5	92.7	6.93	-131	24.8	75.5	0.60		
16	2002/1/31	SS-BN-05-16	22 54'49"	89 12'28"	2535673	726438	30.5	90.5	7.12	-142	25.0	64.4	0.50		
17	2002/1/31	SS-BN-05-17	22 54'50"	89 12'26"	2535671	726395	30.5	90.5	7.12	-148	25.0	58.4	0.60		
18	2002/1/31	SS-BN-05-18	22 54'51"	89 12'26"	2535713	726371	30.5	62.5	7.10	-141	24.8	65.5	0.60		
19	2002/2/1	SS-BN-05-19	22 54'50"	89 12'25"	2535691	726345	30.5								Unused
20	2002/2/1	SS-BN-05-20	22 54'56"	89 12'36"	2535867	726670	50.3	89.6	6.90	-129	25.3	77.2	0.50	0.11	
21	2002/2/1	SS-BN-05-21	22 54'54"	89 12'37"	2535822	726688	53.3	90.0	7.20	-130	25.2	76.2	0.50		
22	2002/2/1	SS-BN-05-22	22 54'55"	89 12'38"	2535834	726710	36.6	89.5	7.20	-130	25.3	76.2	0.50		
23	2002/2/1	SS-BN-05-23	22 54'55"	89 12'39"	2535836	726744	44.2	46.8	7.27	-120	24.3	86.9	0.60		
24	2002/2/1	SS-BN-05-24	22 54'55"	89 12'40"	2535839	726775	54.9	50.2	7.25	-128	25.0	78.4	0.60		
25	2002/2/1	SS-BN-05-25	22 54'53"	89 12'38"	2535794	726720	54.9	86.2	7.10	-114	24.6	92.7	0.60		
26	2002/2/1	SS-BN-05-26	22 54'53"	89 12'36"	2535773	726668	54.9	90.2	6.96	-90	25.2	116.2	0.50		
27	2002/2/1	SS-BN-05-27	22 54'47"	89 12'40"	2535604	726677	54.9	78.0	7.19	-130	25.2	76.2	0.60		
28	2002/2/1	SS-BN-05-28	22 54'47"	89 12'44"	2535606	726608	54.9	55.9	7.20	-125	25.2	81.2	0.50		
29	2002/2/1	SS-BN-05-29	22 54'47"	89 12'42"	2535609	726841	54.9	53.6	7.20	-128	25.5	78.0	0.50		
30	2002/2/1	SS-BN-05-30	22 54'47"	89 12'47"	2535596	726818	41.1	93.4	7.12	-125	24.8	81.5	0.50	0.12	
31	2002/2/1	SS-BN-05-31	22 54'46"	89 12'41"	2535570	726818	41.1	84.7	7.16	-122	25.2	84.2	0.60		
32	2002/2/1	SS-BN-05-32	22 54'45"	89 12'36"	2535526	726661	50.3	80.7	7.20	-130	24.7	76.6	0.50		
33	2002/2/1	SS-BN-05-33	22 54'45"	89 12'36"	2535535	726670	36.6	74.5	7.07	-120	25.2	86.2	0.50		
34	2002/2/1	SS-BN-05-34	22 54'44"	89 12'36"	2535514	726664	50.3	76.0	7.10	-127	25.3	79.2	0.60		
35	2002/2/1	SS-BN-05-35	22 54'43"	89 12'36"	2535471	726682	54.9	80.7	7.16	-103	25.1	103.3	0.50		
36	2002/2/1	SS-BN-05-36	22 54'42"	89 12'42"	2535444	726667	50.3	78.7	7.26	-117	25.2	89.2	0.50		
37	2002/1/30	SS-BN-02-01	22 55'13"	89 12'13"	2536391	726002	27.4	52.3	6.94	-89	24.9	117.4	0.09		
38	2002/1/30	SS-BN-02-02	22 55'21"	89 12'21"	2535520	726232	38.1	109.7	7.05	-122	25.8	83.8	0.30		
39	2002/1/30	SS-BN-02-03	22 55'20"	89 12'22"	2535615	726265	47.2	114.3	6.95	-113	25.1	93.3	0.10		
40	2002/1/30	SS-BN-02-04	22 55'20"	89 12'23"	2535624	726297	44.2	120.2	6.95	-109	25.7	96.9	0.20		
41	2002/1/30	SS-BN-02-05	22 55'23"	89 12'27"	2535689	726396	UK	109.3	7.07	-112	25.4	94.1	0.40		
42	2002/1/30	SS-BN-02-06	22 55'22"	89 12'27"	2535687	726410	39.6	102.2	7.03	-109	24.4	97.8	0.10		
43	2002/1/30	SS-BN-02-07	22 55'21"	89 12'28"	2535639	726421	39.6	104.4	7.01	-110	25.7	95.9	0.30		
44	2002/1/30	SS-BN-02-08	22 55'23"	89 12'30"	2536693	726472	UK	102.3	7.07	-99	25.4	107.1	0.50		
45	2002/2/1	SS-BN-02-09	22 55'24"	89 12'29"	2536718	726456	48.8	115.5	6.84	-91	25.8	114.8	0.20		
46	2002/2/1	SS-BN-02-10	22 55'20"	89 12'29"	2536613	726456	48.8	107.6	6.98	-113	24.4	93.8	0.40	0.16	
47	2002/2/1	SS-BN-02-11	22 55'20"	89 12'33"	2536625	726578	64.0	119.8	7.01	-99	25.5	107.0	0.40		
48	2002/2/1	SS-BN-02-12	22 55'21"	89 12'33"	2536614	726576	61.0	98.2	7.13	-106	25.8	99.8	0.60		
49	2002/2/1	SS-BN-02-13	22 55'21"	89 12'34"	2536643	726601	42.7	64.9	7.11	-111	25.0	95.4	0.40		
50	2002/2/1	SS-BN-02-14	22 55'20"	89 12'34"	2536606	726605	42.7	124.6	7.05	-112	25.1	94.3	0.50		
51	2002/2/1	SS-BN-02-15	22 55'19"	89 12'32"	2536578	726535	42.7	120.5	7.02	-116	25.2	90.2	0.50		
52	2002/2/1	SS-BN-02-16	22 55'19"	89 12'33"	2536587	726566	76.2	54.5	7.14	-122	24.9	84.4	0.50		
53	2002/2/1	SS-BN-02-17	22 55'18"	89 12'33"	2536560	726576	47.2	98.4	7.11	-114	25.7	91.9	0.50		
54	2002/2/1	SS-BN-02-18	22 55'19"	89 12'37"	2536588	726692	64.0								Unused
55	2002/2/1	SS-BN-02-19	22 55'18"	89 12'35"	2536563	726637	47.2	121.1	7.07	-118	25.3	88.2	0.50		
56	2002/2/1	SS-BN-02-20	22 55'15"	89 12'35"	2536544	726614	47.2	55.9	7.04	-115	25.3	91.2	0.50	0.17	
57	2002/2/1	SS-BN-02-21	22 55'17"	89 12'36"	2536523	726647	47.2	101.4	7.08	-126	25.4	80.1	0.50		
58	2002/2/1	SS-BN-02-22	22 55'20"	89 12'39"	2536612	726725	47.2	53.6	7.16	-108	24.5	98.7	0.60		
59	2002/2/1	SS-BN-02-23	22 55'17"	89 12'39"	2536614	726738	41.1	105.1	7.20	-99	24.5	107.7	0.50		
60	2002/2/1	SS-BN-02-24	22 55'15"	89 12'31"	2536460	726516	54.9								Unused
61	2002/2/1	SS-BN-02-25	22 55'14"	89 12'31"	2536420	726504	42.7	119.1	6.91	-108	25.8	97.8	0.40		
62	2002/2/1	SS-BN-02-26	22 55'13"	89 12'31"	2536403	726505	42.7	107.7	6.93	-105	25.6	100.9	0.40		

Table 3.2.15 Results of Screening Survey (Bhagati Narendrapur: No.1 to No.367)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
63	2002/2/1	SS-BN-02-27	22 55'12"	89 12'29"	2536464	726468	42.7	55.7	6.92	-116	25.0	90.4	0.40		
64	2002/2/1	SS-BN-02-28	22 55'13"	89 12'32"	2536392	726544	42.7	5.6	7.02	-115	25.3	91.2	0.30		
65	2002/2/1	SS-BN-02-29	22 55'14"	89 12'33"	2536435	726582	47.2	53.3	7.09	-115	25.4	91.1	0.50		
66	2002/2/2	SS-BN-05-37	22 54'50"	89 12'14"	2535679	726027	30.5	56.6	7.12	-90	25.2	116.2	0.02	0.0029	
67	2002/2/2	SS-BN-05-38	22 54'51"	89 12'16"	2535702	726085	30.5	50.8	7.07	-95	24.3	111.9	0.02	0.014	
68	2002/2/2	SS-BN-05-39	22 54'51"	89 12'16"	2535714	726085	30.5	50.7	7.21	-116	24.3	90.9	0.06		
69	2002/2/2	SS-BN-05-40	22 54'51"	89 12'17"	2535713	726115	30.5	51.0	7.09	-109	24.5	97.7	0.03	0.047	
70	2002/2/2	SS-BN-05-41	22 54'50"	89 12'17"	2535687	726116	30.5	50.0	7.20	-115	25.7	90.9	0.20		
71	2002/2/2	SS-BN-05-42	22 54'50"	89 12'17"	2535675	726137	30.5	56.5	7.10	-110	25.2	96.2	0.50		
72	2002/2/2	SS-BN-05-43	22 54'48"	89 12'19"	2535634	726193	30.5	52.3	7.10	-111	24.8	95.5	0.50		
73	2002/2/2	SS-BN-05-44	22 54'51"	89 12'20"	2535700	726210	97.5	75.7	7.36	-100	25.0	106.4	0.04		
74	2002/2/2	SS-BN-05-45	22 54'51"	89 12'20"	2535706	726219	30.5	67.7	7.30	-120	25.0	86.4	0.40		
75	2002/2/2	SS-BN-05-46	22 54'52"	89 12'20"	2535747	726204	30.5	75.2	7.16	-96	24.7	110.6	0.60		
76	2002/2/2	SS-BN-05-47	22 54'47"	89 12'22"	2535598	726265	30.5	55.7	7.16	-94	25.5	112.0	0.40		
77	2002/2/3	SS-BN-05-48	22 54'47"	89 12'23"	2535602	726288	30.5	75.9	7.21	-80	24.6	126.7	0.50		
78	2002/2/3	SS-BN-05-49	22 54'47"	89 12'24"	2535582	726338	67.1	51.8	7.19	-115	25.5	91.0	0.50		
79	2002/2/3	SS-BN-05-50	22 54'46"	89 12'25"	2535576	726347	50.3	55.6	7.21	-125	25.5	81.0	0.60		
80	2002/2/3	SS-BN-05-51	22 54'45"	89 12'27"	2535538	726426	30.5								Unused
81	2002/2/3	SS-BN-05-52	22 54'45"	89 12'28"	2535543	726435	30.5	86.0	7.16	-102	24.4	104.8	0.40		
82	2002/2/3	SS-BN-05-53	22 54'45"	89 12'31"	2535522	726515	50.3	51.9	7.36	-117	25.2	89.2	0.04		
83	2002/2/3	SS-BN-05-54	22 54'44"	89 12'33"	2535493	726574	30.5	52.1	7.30	-124	25.6	81.9	0.04		
84	2002/2/3	SS-BN-05-55	22 54'43"	89 12'35"	2535470	726649	30.5	53.2	7.24	-98	25.5	108.0	0.40		
85	2002/2/3	SS-BN-05-56	22 54'43"	89 12'39"	2535477	726750	41.1	62.3	7.12	-111	24.6	95.7	0.50		
86	2002/2/3	SS-BN-05-57	22 54'41"	89 12'38"	2535399	726736	45.7								Unused
87	2002/2/3	SS-BN-05-58	22 54'39"	89 12'39"	2535363	726762	36.6	52.3	7.16	-110	25.2	96.2	0.50		
88	2002/2/3	SS-BN-05-59	22 54'39"	89 12'39"	2535366	726766	33.5	53.2	7.25	-99	25.5	107.0	0.50		
89	2002/2/3	SS-BN-05-60	22 54'37"	89 12'40"	2535304	726780	54.9	45.5	7.09	-118	25.1	88.3	0.60		
90	2002/2/3	SS-BN-05-61	22 54'39"	89 12'40"	2535340	726785	36.6	53.2	7.07	-124	24.8	82.5	0.50		
91	2002/2/3	SS-BN-05-62	22 54'39"	89 12'40"	2535364	726798	50.3	56.6	7.11	-123	24.9	83.4	0.50		
92	2002/2/3	SS-BN-05-63	22 54'41"	89 12'40"	2535406	726790	36.6	75.6	7.06	-109	24.8	97.5	0.50		
93	2002/2/3	SS-BN-05-64	22 54'41"	89 12'40"	2535404	726775	50.3	52.6	7.10	-116	25.0	90.4	0.50		
94	2002/2/3	SS-BN-05-65	22 54'41"	89 12'39"	2535405	726761	36.6	48.7	7.09	-116	24.7	90.6	0.50		
95	2002/2/4	SS-BN-05-66	22 54'39"	89 12'41"	2535354	726825	15.2	71.3	7.20	-90	24.4	116.8	0.50		
96	2002/2/4	SS-BN-05-67	22 54'39"	89 12'42"	2535345	726838	24.4	48.3	7.30	-95	24.6	111.7	0.50		
97	2002/2/4	SS-BN-05-68	22 54'37"	89 12'41"	2535288	726812	24.4	55.9	7.25	-112	24.3	94.9	0.60		
98	2002/2/4	SS-BN-05-69	22 54'36"	89 12'42"	2535269	726836	30.5								Unused
99	2002/2/4	SS-BN-05-70	22 54'37"	89 12'43"	2535301	726870	30.5	52.4	7.25	-106	24.4	100.8	0.60	0.15	
100	2002/2/4	SS-BN-05-71	22 54'37"	89 12'13"	2535280	726876	27.4	52.4	6.92	-92	24.4	114.8	0.60		
101	2002/2/4	SS-BN-05-72	22 54'37"	89 12'44"	2535282	726896	27.4	49.7	7.20	-101	24.8	105.5	0.60		
102	2002/2/4	SS-BN-05-73	22 54'37"	89 12'43"	2535281	726882	30.5	76.4	7.23	-102	25.0	104.4	0.50		
103	2002/2/4	SS-BN-05-74	22 54'33"	89 12'45"	2535173	726922	27.4	74.6	7.30	-106	24.3	100.9	0.50		
104	2002/2/4	SS-BN-05-75	22 54'33"	89 12'46"	2535160	726967	45.7	51.8	7.30	-123	25.3	83.2	0.40		
105	2002/2/4	SS-BN-05-76	22 54'31"	89 12'47"	2535127	726974	30.5	90.0	7.32	-111	25.1	95.3	0.50		
106	2002/2/4	SS-BN-05-77	22 54'32"	89 12'47"	2535153	726988	30.5	80.4	7.40	-124	25.0	82.4	0.50		
107	2002/2/4	SS-BN-05-78	22 54'32"	89 12'32"	2535140	726988	27.4	79.3	7.35	-129	25.5	77.0	0.50		
108	2002/2/4	SS-BN-05-79	22 54'31"	89 12'48"	2535118	727009	67.1	51.4	7.40	-121	25.3	85.2	0.50		
109	2002/2/4	SS-BN-05-80	22 54'31"	89 12'48"	2535116	727023	41.1	77.0	7.37	-110	23.5	97.4	0.50	0.20	
110	2002/2/4	SS-BN-05-81	22 54'31"	89 12'50"	2535118	727064	61.0	78.6	7.42	-104	23.3	103.6	0.40		
111	2002/2/4	SS-BN-05-82	22 54'31"	89 12'48"	2535117	727030	30.5								Unused
112	2002/2/4	SS-BN-05-83	22 54'30"	89 12'49"	2535085	727033	67.1	51.5	7.38	-119	25.5	87.0	0.50		
113	2002/2/4	SS-BN-05-84	22 54'30"	89 12'49"	2535080	727049	76.2	53.8	7.42	-124	25.7	81.9	0.40		
114	2002/2/4	SS-BN-05-85	22 54'46"	89 12'46"	2535154	726968	45.7	0.0							Unused
115	2002/2/2	SS-BN-02-30	22 55'02"	89 12'25"	2536068	726337	38.1	43.7	7.04	-99	24.5	107.7	0.60	0.19	
116	2002/2/2	SS-BN-02-31	22 55'04"	89 12'25"	2536106	726357	38.1								Unused
117	2002/2/2	SS-BN-02-32	22 55'05"	89 12'26"	2536157	726370	38.1	40.0	7.11	-111	24.5	95.7	0.40		
118	2002/2/2	SS-BN-02-33	22 55'06"	89 12'26"	2536193	726387	42.7	43.7	7.00	-102	24.0	105.1	0.50		
119	2002/2/2	SS-BN-02-34	22 55'09"	89 12'25"	2536260	726353	42.7	39.4	7.05	-104	23.3	103.6	0.50		
120	2002/2/2	SS-BN-02-35	22 55'09"	89 12'27"	2536273	726397	47.2	39.5	7.11	-101	24.3	105.9	0.50		
121	2002/2/2	SS-BN-02-36	22 55'09"	89 12'26"	2536278	726377	UK	39.6	7.08	-103	24.3	103.9	0.50		
122	2002/2/2	SS-BN-02-37	22 54'42"	89 12'50"	2535440	727075	61.0	44.3	7.08	-99	25.4	107.1	0.60		
123	2002/2/2	SS-BN-02-38	22 54'42"	89 12'50"	2535452	727065	39.6	53.3	6.99	-98	25.5	108.0	0.10		
124	2002/2/2	SS-BN-02-39	22 54'54"	89 13'00"	2535816	727354	65.5	46.9	7.22	-116	24.8	90.5	0.50		
125	2002/2/2	SS-BN-02-40	22 54'54"	89 13'01"	2535838	727382	42.7	96.8	7.11	-124	24.8	82.5	0.60	0.76	
126	2002/2/2	SS-BN-02-41	22 54'55"	89 13'00"	2535857	727343	48.8	55.4	7.14	-106	24.3	100.9	0.60		
127	2002/2/2	SS-BN-02-42	22 54'56"	89 12'58"	2535877	727306	44.2	48.5	7.22	-119	24.9	87.4	0.80		
128	2002/2/2	SS-BN-02-43	22 54'57"	89 12'58"	2535909	727297	UK	51.8	7.18	-112	24.1	95.0	0.60		
129	2002/2/3	SS-BN-02-44	22 55'09"	89 12'50"	2536293	727053	UK	94.9	7.16	-110	25.4	96.1	0.50		
130	2002/2/3	SS-BN-02-45	22 55'08"	89 12'50"	2536247	727068	41.1	92.3	7.17	-87	24.9	119.4	0.50		
131	2002/2/3	SS-BN-02-46	22 55'07"	89 12'51"	2536235	727091	42.7	99.7	7.13	-115	25.2	91.2	0.50		
132	2002/2/3	SS-BN-02-47	22 55'06"	89 12'60"	2536184	727059	UK	102.7	7.13	-114	24.5	92.7	0.40		
133	2002/2/3	SS-BN-02-48	22 55'06"	89 12'50"	2536174	727065	UK	103.5	7.16	-128	25.3	78.2	0.50		
134	2002/2/3	SS-BN-02-49	22 55'06"	89 12'52"	2536204	727125	39.6	91.2	7.17	-125	25.5	81.0	0.40		
135	2002/2/3	SS-BN-02-50	22 55'07"	89 12'53"	2536205	727153	39.6	89.4	7.30	-116	25.9	89.7	0.40	0.19	
136	2002/2/3	SS-BN-02-51	22 55'06"	89 12'45"	2536179	727016	54.9	99.3	7.26	-128	25.0	78.4	0.50		
137	2002/2/3	SS-BN-02-52	22 55'05"	89 12'51"	2536151	727077	54.9	104.3	7.17	-125	25.4	81.1	0.50		
138	2002/2/3	SS-BN-02-53	22 55'03"	89 12'52"	2536098	727118	UK	100.6	7.14	-114	25.4	92.1	0.50		
139	2002/2/3	SS-BN-02-54	22 55'04"	89 12'54"	2536118	727172	59.4	101.2	7.19	-120	25.2	86.2	0.40		
140	2002/2/3	SS-BN-02-55	22 55'01"	89 12'52"	2536036	727120	UK	95.4	7.21	-109	24.9	97.4	0.40		
141	2002/2/3	SS-BN-02-56	22 55'02"	89 12'55"	2536072	727197	50.3	100.0	7.20	-113	26.0	92.6	0.50		
142	2002/2/3	SS-BN-02-57	22 55'04"	89 12'55"	2536120	727200	41.1	89.9	7.22	-121	25.9	84.7	0.60		
143	2002/2/3	SS-BN-02-58	22 55'04"	89 12'55"	2536127	727198	32.0								Unused
144	2002/2/3	SS-BN-02-59	22 55'05"	89 12'54"	2536150	727187	51.8	96.8	7.23	-124	25.4	82.1	0.60		
145	2002/2/3	SS-BN-02-60	22 55'01"	89 12'57"	2536032	727270	50.3	91.7	7.17	-118	25.6	87.9	0.40	0.14	
146	2002/2/3	SS-BN-02-61	22 54'59"	89 12'57"	2535988	727262	32.0	104.1	7.19	-123	24.4	83.8	0.40	0.12	
147	2002/2/3	SS-BN-02-62	22 55'03"	89 12'55"	2536103	727202	54.9	93.8	7.14	-120	25.6	85.9	0.40		
148	2002/2/3	SS-BN-02-63	22 55'03"	89 12'55"	2536102	727220	32.0	91.7	7.21	-118	24.8	88.5	0.40		
149	2002/2/4	SS-BN-02-64	22 54'49"	89 12'47"	2535657	726979	51.8	57.8	7.00	-98	25.1	108.3	0.40		
150	2002/2/4	SS-BN-02-65	22 54'52"	89 12'50"	2535662	727082	42.7	55.1	7.08	-99	25.2	107.2	0.30	0.12	
151	2002/2/5	SS-BN-05-86	22 54'33"	89 12'49"	2535170	727056	54.9								Unused
152	2002/2/5	SS-BN-05-87	22 54'34"	89 12'48"	2535199	727011	30.5	91.5	7.45	-118	24.7	88.6	0.60		
153	2002/2/5	SS-BN-05-88	22 54'36"	89 12'50"	2535256	727059	36.6								Unused
154	2002/2/5	SS-BN-05-89	22 54'37"	89 12'49"	2535301	727031	30.5								Unused
155	2002/2/5	SS-BN-05-90	22 54'37"	89 12'47"	2535305	726995	30.5								Unused
156	2002/2/5	SS-BN-05-91	22 54'38"	89 12'47"	2535323	726985	30.5								Unused
157	2002/2/5	SS-BN-05-92	22 54'39"	89 12'49"	2535343	727031	30.5								Unused

Table 3.2.15 Results of Screening Survey (Bhagati Narendrapur: No.1 to No.367)

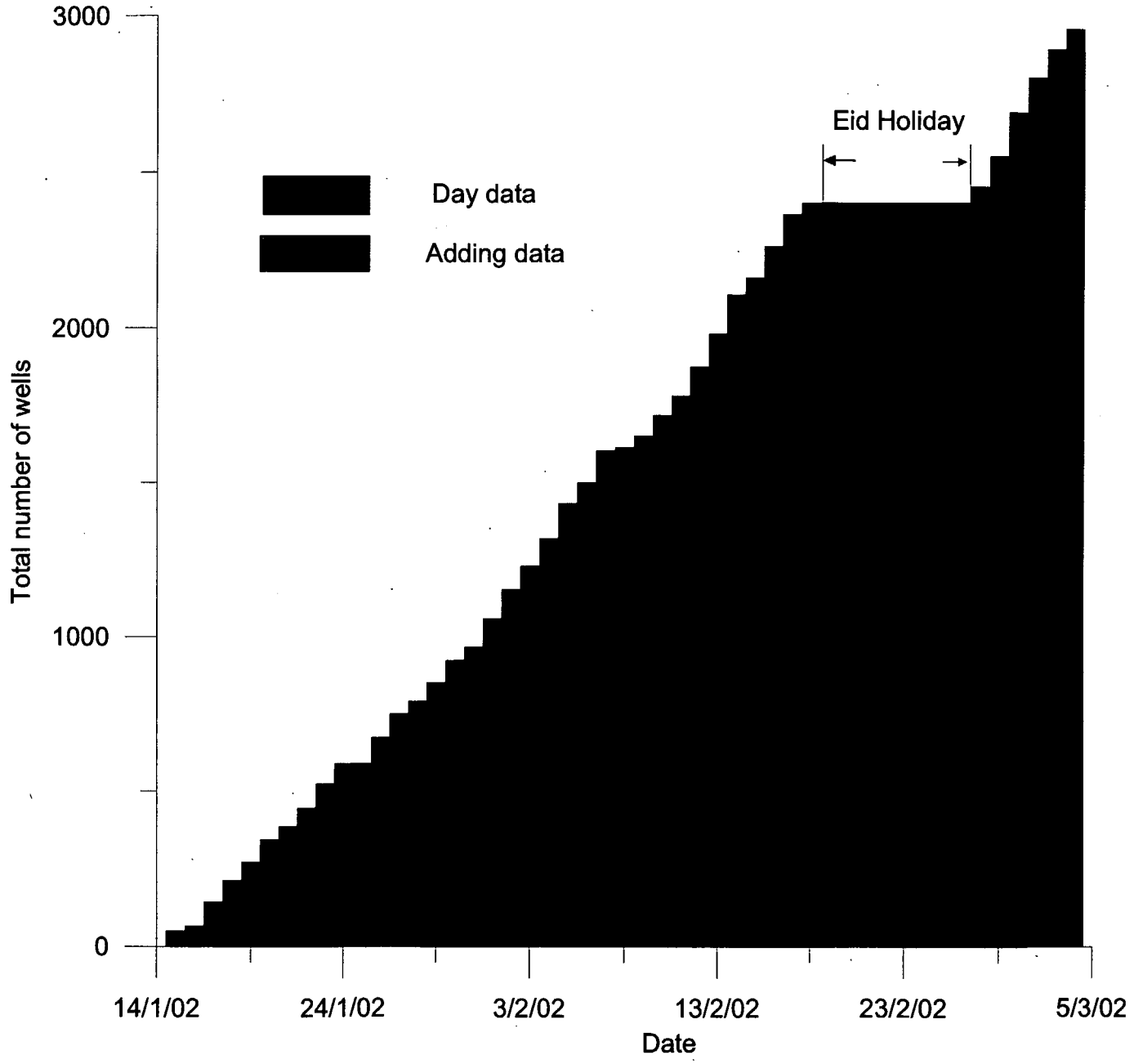
No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
158	2002/2/5	SS-BN-05-93	22 54'36"	89 12'37"	2535261	726694	21.3	78.1	7.48	-138	24.7	68.6	0.30	0.10	
159	2002/2/5	SS-BN-05-94	22 54'37"	89 12'37"	2535298	726689	30.5	54.1	7.37	-129	24.8	77.5	0.50		
160	2002/2/5	SS-BN-05-95	22 54'37"	89 12'36"	2535296	726680	30.5	56.4	7.42	-137	24.3	69.9	0.04	0.017	
161	2002/2/5	SS-BN-05-96	22 54'38"	89 12'35"	2535309	726650	33.5	110.0	7.47	-130	24.8	76.5	0.30		
162	2002/2/5	SS-BN-05-97	22 54'37"	89 12'35"	2535294	726639	30.5								Unused
163	2002/2/5	SS-BN-05-98	22 54'37"	89 12'34"	2535287	726616	30.5	54.3	7.40	-128	24.6	78.7	0.40		
164	2002/2/5	SS-BN-05-99	22 54'37"	89 12'34"	2535284	726604	33.5	54.8	7.40	-119	24.8	87.5	0.40		
165	2002/2/5	SS-BN-05-100	22 54'37"	89 12'33"	2535299	726586	30.5	89.9	7.09	-128	25.1	78.3	0.50	0.14	
166	2002/2/5	SS-BN-05-101	22 54'35"	89 12'32"	2535235	726555	36.6	54.3	7.09	-130	24.6	76.7	0.50		
167	2002/2/5	SS-BN-05-102	22 54'35"	89 12'32"	2535217	726573	30.5	56.5	7.21	-131	24.3	75.9	0.40		
168	2002/2/5	SS-BN-05-103	22 54'35"	89 12'31"	2535232	726558	15.2	54.5	7.03	-130	24.8	76.5	0.60		
169	2002/2/5	SS-BN-05-104	22 54'37"	89 12'30"	2535277	726515	30.5	56.5	7.12	-136	24.3	70.9	0.60		
170	2002/2/5	SS-BN-05-105	22 54'38"	89 12'28"	2535329	726453	30.5	51.6	7.08	-139	24.9	67.4	0.50		
171	2002/2/5	SS-BN-05-106	22 54'38"	89 12'27"	2535328	726429	30.5	52.0	7.11	-141	25.0	65.4	0.50		
172	2002/2/5	SS-BN-05-107	22 54'37"	89 12'35"	2535276	726429	30.5								Unused
173	2002/2/12	SS-BN-05-108	22 54'48"	89 12'27"	2535624	726416	30.5	80.4	7.10	-112	25.9	93.7	0.60		
174	2002/2/12	SS-BN-05-109	22 54'37"	89 12'36"	2535288	726665	30.5								Unused
175	2002/2/7	SS-BN-05-110	22 54'40"	89 12'35"	2535348	726644	30.5	78.1	7.48	-132	24.7	74.6	0.30	0.066	
176	2002/2/7	SS-BN-05-111	22 54'40"	89 12'35"	2535385	726636	30.5	79.5	7.07	-134	25.5	72.0	0.30		
177	2002/2/7	SS-BN-05-112	22 54'40"	89 12'33"	2535390	726590	50.3	89.1	7.14	-117	25.1	89.3	0.40		
178	2002/2/7	SS-BN-05-113	22 54'40"	89 12'33"	2535385	726590	48.8	80.2	7.16	-126	25.3	80.2	0.40		
179	2002/2/7	SS-BN-05-114	22 54'40"	89 12'33"	2535385	726589	30.5	85.0	7.14	-116	24.6	90.7	0.40		
180	2002/2/7	SS-BN-05-115	22 54'40"	89 12'33"	2535383	726585	30.5	79.8	7.17	-109	24.9	97.4	0.50		
181	2002/2/7	SS-BN-05-116	22 54'40"	89 12'33"	2535380	726572	30.5	91.5	7.03	-125	24.7	81.6	0.40		
182	2002/2/7	SS-BN-05-117	22 54'40"	89 12'33"	2535369	726574	30.5	94.0	7.20	-134	25.4	72.1	0.40		
183	2002/2/7	SS-BN-05-118	22 54'40"	89 12'33"	2535366	726581	30.5	89.9	7.09	-128	25.1	78.3	0.50		
184	2002/2/7	SS-BN-05-119	22 54'40"	89 12'33"	2535393	726551	36.6	92.2	7.21	-129	25.3	77.2	0.50		
185	2002/2/7	SS-BN-05-120	22 54'40"	89 12'30"	2535376	726513	30.5	87.0	7.23	-137	25.4	69.1	0.60	0.95	
186	2002/2/7	SS-BN-05-121	22 54'41"	89 12'30"	2535407	726514	30.5	88.0	7.13	-145	25.3	61.2	0.50		
187	2002/2/7	SS-BN-05-122	22 54'33"	89 12'26"	2535168	726378	36.6	51.3	7.16	-147	25.6	58.9	0.50		
188	2002/2/7	SS-BN-05-123	22 54'32"	89 12'24"	2535130	726347	27.4	91.5	7.06	-130	24.8	76.5	0.40		
189	2002/2/7	SS-BN-05-124	22 54'32"	89 12'24"	2535128	726338	30.5	78.1	7.20	-135	24.8	71.5	0.50		
190	2002/2/7	SS-BN-05-125	22 54'31"	89 12'24"	2535115	726321	30.5	54.8	7.10	-136	24.8	70.5	0.40		
191	2002/2/7	SS-BN-05-126	22 54'29"	89 12'20"	2535037	726212	30.5	56.2	7.10	-140	25.0	66.4	0.30		
192	2002/2/7	SS-BN-05-127	22 54'30"	89 12'21"	2535032	726236	27.4	79.1	7.09	-139	25.9	66.7	0.40		
193	2002/2/7	SS-BN-05-128	22 54'30"	89 12'20"	2535034	726121	30.5	79.3	7.11	-144	25.5	62.0	0.50		
194	2002/2/7	SS-BN-05-129	22 54'30"	89 12'20"	2535054	726224	30.5	56.2	7.10	-149	25.0	57.4	0.40		
195	2002/2/7	SS-BN-05-130	22 54'28"	89 12'20"	2535010	726210	30.5	51.3	7.12	-132	25.6	73.9	0.40	0.11	
196	2002/2/11	SS-BN-05-131	22 54'28"	89 12'19"	2534990	726199	30.5	42.0	7.38	-80	24.8	126.5	0.30		
197	2002/2/11	SS-BN-05-132	22 54'27"	89 12'19"	2534969	726196	27.4	43.5	7.41	-82	25.6	123.9	0.30		
198	2002/2/11	SS-BN-05-133	22 54'27"	89 12'18"	2534956	726163	30.5	45.5	7.20	-85	25.0	121.4	0.20		
199	2002/2/11	SS-BN-05-134	22 54'26"	89 12'16"	2534942	726097	30.5	56.2	7.41	-102	25.0	104.4	0.10		
200	2002/2/11	SS-BN-05-135	22 54'25"	89 12'15"	2534926	726074	30.5	54.8	7.30	-114	24.8	92.5	0.20		
201	2002/2/11	SS-BN-05-136	22 54'25"	89 12'14"	2534898	726053	30.5	74.7	7.40	-120	25.8	85.8	0.10		
202	2002/2/11	SS-BN-05-137	22 54'25"	89 12'13"	2534920	726034	30.5	78.1	7.39	-124	24.8	82.5	0.10		
203	2002/2/11	SS-BN-05-138	22 54'25"	89 12'13"	2534898	726021	30.5	77.5	7.36	-129	26.0	76.6	0.10		
204	2002/2/11	SS-BN-05-139	22 54'24"	89 12'12"	2534887	726004	30.5	73.5	7.34	-135	25.6	70.9	0.20		
205	2002/2/11	SS-BN-05-140	22 54'25"	89 12'12"	2534918	725985	30.5	79.0	7.24	-139	25.8	66.8	0.30	0.13	
206	2002/2/11	SS-BN-05-141	22 54'26"	89 12'12"	2534949	725995	30.5	85.4	7.17	-140	25.8	65.8	0.20		
207	2002/2/11	SS-BN-05-142	22 54'27"	89 12'11"	2534974	725976	33.5	79.7	7.42	-142	25.5	64.0	0.20		
208	2002/2/11	SS-BN-05-143	22 54'28"	89 12'10"	2534993	725949	33.5	73.8	7.40	-140	25.6	65.9	0.02	0.021	
209	2002/2/11	SS-BN-05-144	22 54'29"	89 12'10"	2534021	725944	27.4								Unused
210	2002/2/11	SS-BN-05-145	22 54'25"	89 12'11"	2534906	725977	27.4	77.0	7.36	-142	25.6	63.9	0.01	0.050	
211	2002/2/11	SS-BN-05-146	22 54'25"	89 12'11"	2534906	725955	30.5	73.4	7.42	-116	25.9	89.7	0.20		
212	2002/2/11	SS-BN-05-147	22 54'24"	89 12'10"	2534893	725951	30.5	73.1	7.40	-140	25.6	65.9	0.10		
213	2002/2/11	SS-BN-05-148	22 54'24"	89 12'09"	2534878	725906	30.5	76.0	7.47	-136	25.4	70.1	0.01		
214	2002/2/11	SS-BN-05-149	22 54'25"	89 12'09"	2534900	725909	30.5	73.1	7.45	-139	25.6	66.9	0.10		
215	2002/2/11	SS-BN-05-150	22 54'26"	89 12'10"	2534926	725936	30.5	83.4	7.38	-148	25.5	58.0	0.10	0.058	
216	2002/2/11	SS-BN-05-151	22 54'27"	89 12'10"	2534978	725932	30.5	77.0	7.48	-149	25.6	56.9	0.02		
217	2002/2/12	SS-BN-05-152	22 54'41"	89 12'48"	2535404	727016	45.7	78.5	7.25	-92	25.3	114.2	0.40		
218	2002/2/12	SS-BN-05-153	22 54'24"	89 12'06"	2534887	725837	30.5	85.0	7.27	-118	25.4	88.1	0.20		
219	2002/2/12	SS-BN-05-154	22 54'24"	89 12'05"	2534873	725806	30.5	73.5	7.20	-120	25.5	86.0	0.10		
220	2002/2/12	SS-BN-05-155	22 54'25"	89 12'05"	2534890	725887	30.5								Unused
221	2002/2/12	SS-BN-05-156	22 54'25"	89 12'05"	2534917	725803	30.5	77.5	7.36	-142	25.4	64.1	0.10		
222	2002/2/12	SS-BN-05-157	22 54'25"	89 12'05"	2534919	725781	27.4	82.5	7.25	-116	25.1	90.3	0.10		
223	2002/2/12	SS-BN-05-158	22 54'27"	89 12'05"	2534983	725806	30.5	88.5	7.34	-146	26.0	59.6	0.30		
224	2002/2/12	SS-BN-05-159	22 54'29"	89 12'07"	2534027	725848	30.5	82.5	7.36	-142	25.2	64.2	0.08		
225	2002/2/12	SS-BN-05-160	22 54'30"	89 12'07"	2535056	725848	51.8	89.5	7.40	-142	25.7	63.9	0.09	0.023	
226	2002/2/12	SS-BN-05-161	22 54'30"	89 12'06"	2535051	725828	30.5	92.5	7.21	-133	25.4	73.1	0.10		
227	2002/2/12	SS-BN-05-162	22 54'31"	89 12'07"	2535098	725852	27.4	90.5	7.44	-145	25.9	60.7	0.09		
228	2002/2/12	SS-BN-05-163	22 54'31"	89 12'06"	2535108	725814	30.5	95.5	7.44	-156	25.8	49.8	0.10		
229	2002/2/12	SS-BN-05-164	22 54'30"	89 12'05"	2535056	725793	30.5	85.3	7.42	-142	25.6	63.9	0.20		
230	2002/2/12	SS-BN-05-165	22 54'30"	89 12'05"	2535068	725786	30.5	89.0	7.41	-145	25.6	60.9	0.10		
231	2002/2/12	SS-BN-05-166	22 54'25"	89 12'04"	2534898	725770	27.4	79.0	7.30	-143	25.7	62.9	0.10		
232	2002/2/12	SS-BN-05-167	22 54'22"	89 12'06"	2534831	725810	30.5	72.0	7.37	-140	25.3	66.2	0.10		
233	2002/2/12	SS-BN-05-168	22 54'21"	89 12'07"	2534795	725845	30.5	77.5	7.40	-148	25.8	57.8	0.10		
234	2002/2/12	SS-BN-05-169	22 54'19"	89 12'07"	2534730	725858	30.5	78.2	7.32	-146	25.5	60.0	0.20		
235	2002/2/12	SS-BN-05-170	22 54'19"	89 12'08"	2534715	725894	45.7	75.5	7.36	-136	25.5	70.0	0.20	0.10	
236	2002/2/12	SS-BN-05-171	22 54'19"	89 12'09"	2534729	725909	36.6	72.0	7.32	-152	25.4	54.1	0.20		
237	2002/2/12	SS-BN-05-172	22 54'21"	89 12'09"	2534780	725914	30.5	102.5	7.39	-140	25.6	65.9	0.01		
238	2002/2/13	SS-BN-05-173	22 54'24"	89 12'02"	2534880	725719	30.5	92.5	7.36	-118	25.2	88.2	0.10		
239	2002/2/13	SS-BN-05-174	22 54'23"	89 12'02"	2534858	725708	27.4	93.6	7.31	-120	25.7	85.9	0.03	0.042	
240	2002/2/13	SS-BN-05-175	22 54'22"	89 12'02"	2534827	725700	21.3	90.6	7.40	-125	25.9	80.7	0.03	0.017	
241	2002/2/13	SS-BN-05-176	22 54'23"	89 12'03"	2534829	725730	27.4	91.0	7.38	-130	26.0	75.6	0.20		
242	2002/2/13	SS-BN-05-177	22 54'27"	89 11'56"	2534957	725541	30.5	73.6	7.37	-140	25.6	65.9	0.30		
243	2002/2/13	SS-BN-05-178	22 54'27"	89 11'55"	2534972	725515	30.5	90.5	7.39	-142	25.0	64.4	0.20		
244	2002/2/13	SS-BN-05-179	22 54'27"	89 11'55"	2534974	725503	UK	99.7	7.38	-145	25.2	61.2	0.40		
245	2002/2/13	SS-BN-05-180	22 54'28"	89 11'54"	2534986	725482	27.4	103.2	7.42	-82	24.5	124.7	0.20	0.17	
246	2002/2/13	SS-BN-05-181	22 54'27"	89 11'53"	2534963	725452	30.5	96.1	7.30	-102	25.4	104.1	0.30		
247	2002/2/13	SS-BN-05-182	22 54'30"	89 11'51"	2535044	725392	21.3	92.5	7.40	-139	25.3	67.2	0.30		
248	2002/2/13	SS-BN-05-183	22 54'30"	89 11'51"	2535059	725398	24.4	90.9	7.37	-144	25.4	62.1	0.20		
249	2002/2/13	SS-BN-05-184	22 54'32"	89 11'53"	2535110	725445	30.5	95.5	7.36	-143	25.4	63.1	0.03	0.013	
250	2002/2/13	SS-BN-05-185	22 54'31"	89 11'54"	2535087	725478	30.5	93.5	7.40	-139	25.6	66.9	0.10		
251	2002/2/13	SS-BN-05-186	22 54'30"	89 11'55"	2535060	725503	30.5	92.5	7.42	-138	25.5	68.0	0.03	0.006	
252	2002/2/13	SS-BN-05-187	22 54'30"	89 11'55"	2535045	725508	36.6	89.0	7.40	-137	25.6	68.9	0.03	0.018	

Table 3.2.15 Results of Screening Survey (Bhagati Narendrapur: No.1 to No.367)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
253	2002/2/13	SS-BN-05-188	22 54'29"	89 11'54"	2535024	725478	30.5	94.4	7.43	-143	25.0	63.4	0.03	0.044	
254	2002/2/13	SS-BN-05-189	22 54'29"	89 11'56"	2535429	725548	15.2	90.0	7.43	-140	25.6	65.9	0.04		
255	2002/2/13	SS-BN-05-190	22 54'24"	89 11'57"	2534882	725578	18.3	92.0	7.40	-142	25.5	64.0	0.20	0.11	
256	2002/2/13	SS-BN-05-191	22 54'24"	89 11'55"	2534888	725509	33.5	93.5	7.32	-146	25.6	59.9	0.40		
257	2002/2/13	SS-BN-05-192	22 54'24"	89 11'55"	2534865	725514	27.4	90.5	7.30	-145	25.5	61.0	0.20		
258	2002/2/13	SS-BN-05-193	22 54'24"	89 11'54"	2534879	725496	27.4	91.2	7.32	-146	25.6	59.9	0.40		
259	2002/2/13	SS-BN-05-194	22 54'24"	89 11'53"	2534870	725448	15.2	94.5	7.35	-143	25.9	62.7	0.02	0.027	
260	2002/2/13	SS-BN-05-195	22 54'26"	89 11'52"	2534927	725429	30.5	93.5	7.29	-142	25.8	63.8	0.04	0.13	
261	2002/2/13	SS-BN-05-196	22 54'24"	89 11'51"	2534876	725404	15.2	95.5	7.42	-144	26.0	61.6	0.02	0.030	
262	2002/2/13	SS-BN-05-197	22 54'28"	89 11'50"	2534993	725359	30.5	93.1	7.38	-138	25.6	67.9	0.02	0.026	
263	2002/2/13	SS-BN-05-198	22 54'29"	89 11'49"	2535026	725339	27.4	94.1	7.36	-140	25.0	66.4	0.02	0.021	
264	2002/2/13	SS-BN-05-199	22 54'29"	89 11'49"	2535022	725341	21.3	92.0	7.47	-121	26.0	84.6	0.09		
265	2002/2/13	SS-BN-05-200	22 54'30"	89 11'49"	2535048	725343	24.4	90.1	7.49	-125	26.3	80.4	0.02		
266	2002/2/13	SS-BN-05-201	22 54'30"	89 11'50"	2535045	725374	21.3	102.4	7.40	-118	25.9	87.7	0.06		
267	2002/2/14	SS-BN-05-202	22 54'20"	89 11'48"	2534735	725306	30.5	98.5	7.40	-120	25.0	86.4	0.01	0.011	
268	2002/2/14	SS-BN-05-203	22 54'21"	89 12'09"	2534792	725899	30.5	95.2	7.38	-118	25.6	87.9	0.09		
269	2002/2/14	SS-BN-05-204	22 54'12"	89 11'46"	2534497	725371	30.5	99.2	7.42	-113	24.8	93.5	0.02	0.0061	
270	2002/2/14	SS-BN-05-205	22 54'12"	89 11'46"	2534498	725273	27.4	101.9	7.45	-92	25.2	114.2	0.02	0.0045	
271	2002/2/14	SS-BN-05-206	22 54'12"	89 11'47"	2534497	725298	24.4	82.6	7.44	-90	25.3	116.2	0.02	0.010	
272	2002/2/14	SS-BN-05-207	22 54'12"	89 11'47"	2534491	725299	30.5	95.5	7.45	-119	25.0	87.4	0.02	0.0051	
273	2002/2/14	SS-BN-05-208	22 54'11"	89 11'47"	2534482	725288	UK	105.5	7.30	-106	25.3	100.2	0.02	0.0055	
274	2002/2/14	SS-BN-05-209	22 54'10"	89 11'47"	2534453	725282	41.1	101.5	7.48	-108	25.0	98.4	0.02		
275	2002/2/14	SS-BN-05-210	22 54'10"	89 11'46"	2534432	725259	27.4	90.5	7.43	-110	25.5	96.0	0.20		
276	2002/2/14	SS-BN-05-211	22 54'09"	89 11'47"	2534412	725277	27.4	92.5	7.40	-112	25.6	93.9	0.20		
277	2002/2/14	SS-BN-05-212	22 54'08"	89 11'47"	2534385	725277	27.4	95.5	7.42	-118	25.4	88.1	0.20		
278	2002/2/14	SS-BN-05-213	22 54'09"	89 11'45"	2534396	725236	27.4	96.3	7.39	-119	25.5	87.0	0.20		
279	2002/2/14	SS-BN-05-214	22 54'10"	89 11'46"	2534443	725252	18.3	97.5	7.42	-118	25.3	88.2	0.10		
280	2002/2/14	SS-BN-05-215	22 54'10"	89 11'45"	2534449	725245	24.4	98.5	7.40	-120	25.5	86.0	0.10		
281	2002/2/14	SS-BN-05-216	22 54'11"	89 11'45"	2534467	725234	27.4	97.6	7.35	-110	25.3	96.2	0.10		
282	2002/2/14	SS-BN-05-217	22 54'12"	89 11'49"	2534492	725347	30.5	90.5	7.36	-117	25.4	89.1	0.04	0.018	
283	2002/2/14	SS-BN-05-218	22 54'10"	89 11'50"	2534438	725382	33.5	91.0	7.38	-118	25.6	87.9	0.04	0.026	
284	2002/2/14	SS-BN-05-219	22 54'12"	89 11'50"	2534491	725372	32.0	93.0	7.37	-120	25.5	86.0	0.08		
285	2002/2/14	SS-BN-05-220	22 54'11"	89 11'50"	2534477	725374	33.5	91.0	7.47	-119	25.5	87.0	0.03	0.063	
286	2002/2/14	SS-BN-05-221	22 54'11"	89 11'50"	2534475	725371	35.1	90.3	7.38	-112	25.4	94.1	0.06		
287	2002/2/14	SS-BN-05-222	22 54'11"	89 11'51"	2534462	725399	33.5	88.0	7.43	-123	25.2	83.2	0.07		
288	2002/2/15	SS-BN-05-223	22 54'15"	89 11'50"	2534609	725602	27.4	51.2	7.37	-81	25.6	124.9	0.03	0.014	
289	2002/2/15	SS-BN-05-224	22 54'15"	89 11'51"	2534602	725393	32.0	51.0	7.36	-84	25.2	122.2	0.04	0.023	
290	2002/2/15	SS-BN-05-225	22 54'14"	89 11'52"	2534569	725435	15.2	52.5	7.41	-140	25.6	65.9	0.02	0.014	
291	2002/2/15	SS-BN-05-226	22 54'14"	89 11'53"	2534565	725467	27.4	50.5	7.35	-90	25.5	116.0	0.06		
292	2002/2/15	SS-BN-05-227	22 54'14"	89 11'53"	2534554	725471	48.8	54.0	7.31	-92	25.1	114.3	0.09		
293	2002/2/15	SS-BN-05-228	22 54'13"	89 11'55"	2534545	725502	36.6	53.5	7.33	-98	25.1	108.3	0.08		
294	2002/2/15	SS-BN-05-229	22 54'14"	89 11'55"	2534553	725506	27.4	56.0	7.39	-102	25.5	104.0	0.07		
295	2002/2/15	SS-BN-05-230	22 54'14"	89 11'54"	2534564	725497	45.7	54.0	7.39	-107	25.6	98.9	0.09	0.049	
296	2002/2/15	SS-BN-05-231	22 54'14"	89 11'56"	2534576	725538	27.4	52.7	7.40	-108	25.5	98.0	0.10		
297	2002/2/15	SS-BN-05-232	22 54'15"	89 11'55"	2534587	725526	27.4	51.6	7.39	-110	25.6	95.9	0.06		
298	2002/2/15	SS-BN-05-233	22 54'15"	89 11'55"	2534584	725507	27.4								Unused
299	2002/2/15	SS-BN-05-234	22 54'15"	89 11'54"	2534580	725590	27.4	50.9	7.38	-102	25.1	104.3	0.06		
300	2002/2/15	SS-BN-05-235	22 54'16"	89 11'53"	2534632	725466	36.6	50.7	7.38	-120	25.6	85.9	0.07		
301	2002/2/15	SS-BN-05-236	22 54'15"	89 11'53"	2534609	725449	33.5	49.5	7.36	-123	25.5	83.0	0.08		
302	2002/2/15	SS-BN-05-237	22 54'15"	89 11'53"	2534601	725446	27.4	52.5	7.37	-122	25.6	83.9	0.05	0.025	
303	2002/2/15	SS-BN-05-238	22 54'15"	89 11'52"	2534600	725441	32.0	50.5	7.39	-125	25.5	81.0	0.09		
304	2002/2/15	SS-BN-05-239	22 54'17"	89 11'52"	2534651	725414	24.4	50.5	7.36	-129	25.5	77.0	0.09		
305	2002/2/15	SS-BN-05-240	22 54'19"	89 11'52"	2534716	725442	15.2	52.0	7.38	-132	25.6	73.9	0.20	0.15	
306	2002/2/15	SS-BN-05-241	22 54'17"	89 11'52"	2534663	725432	UK	52.3	7.36	-133	25.5	73.0	0.03		
307	2002/2/15	SS-BN-05-242	22 54'17"	89 11'53"	2534663	725443	27.4								Unused
308	2002/2/15	SS-BN-05-243	22 54'16"	89 11'52"	2534640	725430	27.4	54.0	7.39	-134	25.5	72.0	0.08		
309	2002/2/15	SS-BN-05-244	22 54'18"	89 11'55"	2534680	725509	27.4	53.5	7.40	-136	25.6	69.9	0.20		
310	2002/2/15	SS-BN-05-245	22 54'17"	89 11'56"	2534650	725535	27.4	52.5	7.41	-140	25.6	65.9	0.10		
311	2002/2/15	SS-BN-05-246	22 54'17"	89 11'56"	2534642	725547	27.4								Unused
312	2002/2/15	SS-BN-05-247	22 54'17"	89 11'57"	2534657	725576	27.4								Unused
313	2002/2/15	SS-BN-05-248	22 54'17"	89 11'58"	2534673	725598	27.4	54.0	7.41	-137	25.6	68.9	0.02	0.016	
314	2002/2/15	SS-BN-05-249	22 54'16"	89 11'58"	2534632	725591	27.4	53.0	7.42	-140	25.5	66.0	0.02	0.020	
315	2002/2/15	SS-BN-05-250	22 54'17"	89 11'58"	2534645	725601	45.7	55.0	7.41	-136	25.4	70.1	0.10	0.10	
316	2002/2/15	SS-BN-05-251	22 54'16"	89 11'59"	2534624	725632	24.4	54.5	7.37	-140	25.2	66.2	0.02	0.014	
317	2002/2/15	SS-BN-05-252	22 54'16"	89 11'59"	2534617	725629	32.0	53.5	7.36	-142	25.4	64.1	0.09		
318	2002/2/15	SS-BN-05-253	22 54'15"	89 11'59"	2534606	725632	27.4	52.5	7.38	-145	25.3	61.2	0.10		
319	2002/2/15	SS-BN-05-254	22 54'17"	89 11'59"	2534651	725642	32.0	50.2	7.39	-146	25.6	59.9	0.04	0.017	
320	2002/2/15	SS-BN-05-255	22 54'16"	89 12'00"	2534625	725665	27.4	53.2	7.38	-144	25.4	62.1	0.07		
321	2002/2/15	SS-BN-05-256	22 54'16"	89 12'01"	2534626	725674	27.4	50.4	7.36	-145	25.4	61.1	0.09		
322	2002/2/15	SS-BN-05-257	22 54'16"	89 12'02"	2534631	725696	32.0	52.2	7.40	-144	25.5	62.0	0.05	0.018	
323	2002/2/16	SS-BN-05-258	22 54'16"	89 12'02"	2534634	725717	27.4	51.5	7.30	-82	25.4	124.1	0.05	0.020	
324	2002/2/16	SS-BN-05-259	22 54'16"	89 12'03"	2534639	725732	27.4	52.5	7.30	-82	25.0	124.4	0.05	0.031	
325	2002/2/16	SS-BN-05-260	22 54'17"	89 12'04"	2534671	725766	27.4	48.5	7.33	-80	25.5	126.0	0.10	0.061	
326	2002/2/16	SS-BN-05-261	22 54'17"	89 12'05"	2534667	725801	24.4	49.5	7.36	-90	25.2	116.2	0.10		
327	2002/2/16	SS-BN-05-262	22 54'18"	89 12'04"	2534697	725784	27.4	52.5	7.35	-90	25.3	116.2	0.07		
328	2002/2/16	SS-BN-05-263	22 54'20"	89 12'04"	2534740	725777	41.1	52.3	7.40	-110	25.6	95.9	0.04	0.047	
329	2002/2/16	SS-BN-05-264	22 54'19"	89 12'03"	2534719	725736	24.4	50.3	7.41	-115	25.4	91.1	0.20		
330	2002/2/16	SS-BN-05-265	22 54'19"	89 12'02"	2534713	725716	24.4	52.2	7.39	-118	25.3	88.2	0.04	0.014	
331	2002/2/16	SS-BN-05-266	22 54'19"	89 12'02"	2534733	725714	24.4	52.0	7.40	-120	25.0	86.4	0.20		
332	2002/2/16	SS-BN-05-267	22 54'17"	89 12'07"	2534676	725848	24.4	51.5	7.39	-122	25.4	84.1	0.20		
333	2002/2/16	SS-BN-05-268	22 54'29"	89 12'17"	2535046	726135	21.3	49.5	7.37	-108	25.8	97.8	0.20		
334	2002/2/16	SS-BN-05-269	22 54'29"	89 12'17"	2535027	726136	32.0	50.4	7.39	-121	25.6	84.9	0.10		
335	2002/2/16	SS-BN-05-270	22 54'32"	89 12'17"	2535126	726121	32.0	51.6	7.38	-117	25.5	89.0	0.10	0.058	
336	2002/2/16	SS-BN-05-271	22 54'32"	89 12'17"	2535134	726112	36.6	50.6	7.37	-118	25.4	88.1	0.10		
337	2002/2/16	SS-BN-05-272	22 54'33"	89 12'17"	2535165	726123	24.4	49.5	7.38	-117	25.6	88.9	0.03	0.073	
338	2002/2/16	SS-BN-05-273	22 54'33"	89 12'16"	2535151	726106	27.4	52.5	7.35	-119	25.3	87.2	0.10		
339	2002/2/16	SS-BN-05-274	22 54'34"	89 12'17"	2534179	726120	27.4	50.6	7.40	-122	25.7	83.9	0.08		
340	2002/2/16	SS-BN-05-275	22 54'34"	89 12'16"	2535202	726097	27.4	49.5	7.38	-121	25.4	85.1	0.02	0.035	
341	2002/2/17	SS-BN-05-276	22 54'44"	89 12'10"	2535481	725916	27.4	73.5	6.90	-110	25.8	95.8	0.20		
342	2002/2/17	SS-BN-05-277	22 54'39"	89 12'16"	2535342	726110	19.8	74.0	6.90	-132	25.6	73.9	0.20		
343	2002/2/17	SS-BN-05-278	22 54'39"	89 12'14"	2535357	726055	27.4								Unused
344	2002/2/17	SS-BN-05-279	22 54'40"	89 12'14"	2535387	726031	61.0	49.0	6.89	-112	25.7	93.9	0.10		
345	2002/2/17	SS-BN-05-280	22 54'41"	89 12'15"	2535410	726083	27.4	54.5	7.01	-125	25.4	81.1	0.50	0.16	
346	2002/2/17	SS-BN-05-281	22 54'41"	89 12'15"	2535401	726068	27.4	81.9	6.94	-82	25.7	123.9	0.10		
347	2002/2/17	SS-BN-05-282	22 54'42"	89 12'15"	2535433	726083	27.4	90.2	7.12	-120	24.8	86.5	0.50		

Table 3.2.15 Results of Screening Survey (Bhagati Narendrapur: No.1 to No.367)

No.	Date	Well No.	Coodinates 1				Depth (m)	EC (mS/m)	PH	ORP (mV)	Water Temp (Co)	Eh (mV)	As (FK) (mg/l)	As (AAS) (mg/l)	Remarks
			Latitude	Longitude	UTM										
348	2002/2/17	SS-BN-05-283	22 54'42"	89 12'14"	2535424	726057	32.0	74.5	7.40	-133	25.3	73.2	0.40		
349	2002/2/17	SS-BN-05-284	22 54'42"	89 12'13"	2535429	726025	41.1	75.5	7.21	-134	25.5	72.0	0.10		
350	2002/2/17	SS-BN-05-285	22 54'42"	89 12'11"	2535443	725969	27.4	79.5	7.30	-137	25.4	69.1	0.09		
351	2002/2/17	SS-BN-05-286	22 54'44"	89 12'11"	2535480	725949	15.2	74.5	7.25	-135	25.4	71.1	0.05	0.046	
352	2002/2/17	SS-BN-05-287	22 54'44"	89 12'09"	2535487	725910	41.1	85.5	7.19	-130	25.8	75.8	0.02	0.013	
353	2002/2/17	SS-BN-05-288	22 54'44"	89 12'12"	2535487	725994	35.1	75.5	7.36	-136	25.7	69.9	0.09		
354	2002/2/17	SS-BN-05-289	22 54'45"	89 12'10"	2535530	725927	24.4	74.5	7.38	-137	25.8	68.8	0.02	0.0032	
355	2002/2/17	SS-BN-05-290	22 54'45"	89 12'07"	2535536	725847	27.4	80.5	7.37	-140	25.4	66.1	0.02	0.014	
356	2002/2/17	SS-BN-05-291	22 54'46"	89 12'08"	2535559	725874	32.0	79.5	7.39	-139	25.4	67.1	0.02	0.014	
357	2002/2/17	SS-BN-05-292	22 54'47"	89 12'09"	2535578	725909	24.4	78.5	7.36	-140	25.4	66.1	0.02	0.0065	
358	2002/2/17	SS-BN-05-293	22 54'43"	89 12'16"	2535477	726087	21.3	77.6	7.37	-142	25.4	64.1	0.60		
359	2002/2/17	SS-BN-05-294	22 54'44"	89 12'16"	2535501	726100	32.0	76.5	7.39	-145	25.5	61.0	0.30		
360	2002/2/27	SS-BN-05-295	22 54'46"	89 12'27"	2535560	726113	27.4								Unused
361	2002/2/27	SS-BN-05-296	22 54'47"	89 12'17"	2535586	726115	27.4	75.5	7.00	-95	26.5	110.3	0.01	0.012	
362	2002/2/27	SS-BN-05-297	22 54'48"	89 12'19"	2535610	726170	22.9	66.5	7.12	-110	26.0	95.6	0.04	0.054	
363	2002/2/27	SS-BN-05-298	22 54'45"	89 12'21"	2535551	726330	24.4	74.2	7.13	-120	25.6	85.9	0.08		
364	2002/2/27	SS-BN-05-299	22 54'46"	89 12'19"	2535517	726188	22.9	56.0	7.25	-120	25.7	85.9	0.08		
365	2002/2/27	SS-BN-05-300	22 54'44"	89 12'20"	2535504	726210	22.9	73.5	7.11	-133	25.4	73.1	0.50	0.18	
366	2002/2/27	SS-BN-05-301	22 54'45"	89 12'22"	2535538	726260	22.9	76.9	7.05	-132	25.6	73.9	0.06		
367	2002/2/27	SS-BN-05-302	22 54'43"	89 12'28"	2535477	726447	30.5	75.2	7.29	-120	25.4	86.1	0.03	0.086	



[Except the R.Bankabarsi Mouza that had been surveyed in 2001]

Figure 3.2.2	Number of Surveyed Wells in 16 Mouzas

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

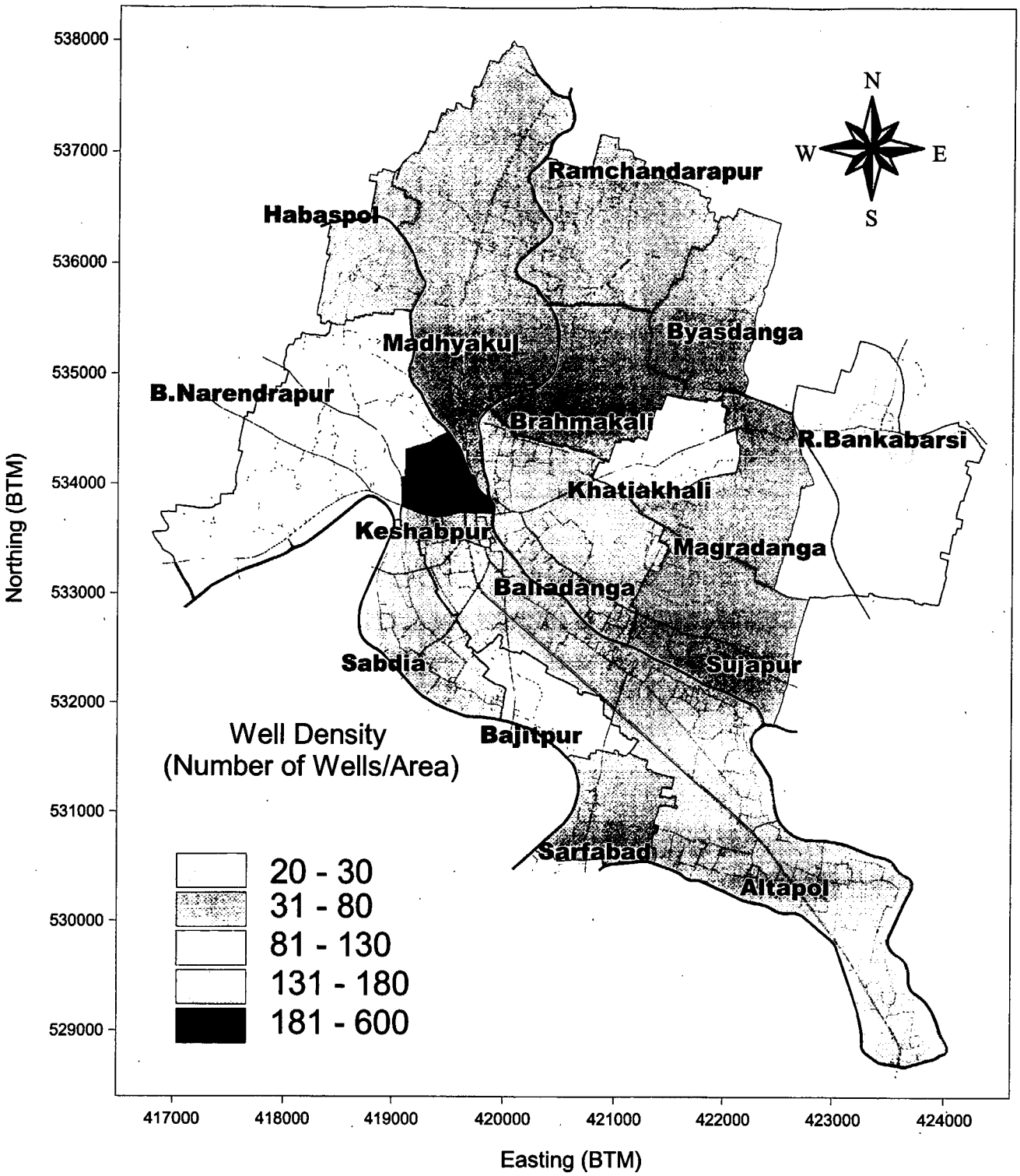


Figure 3.2.4	Well Density / Area
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

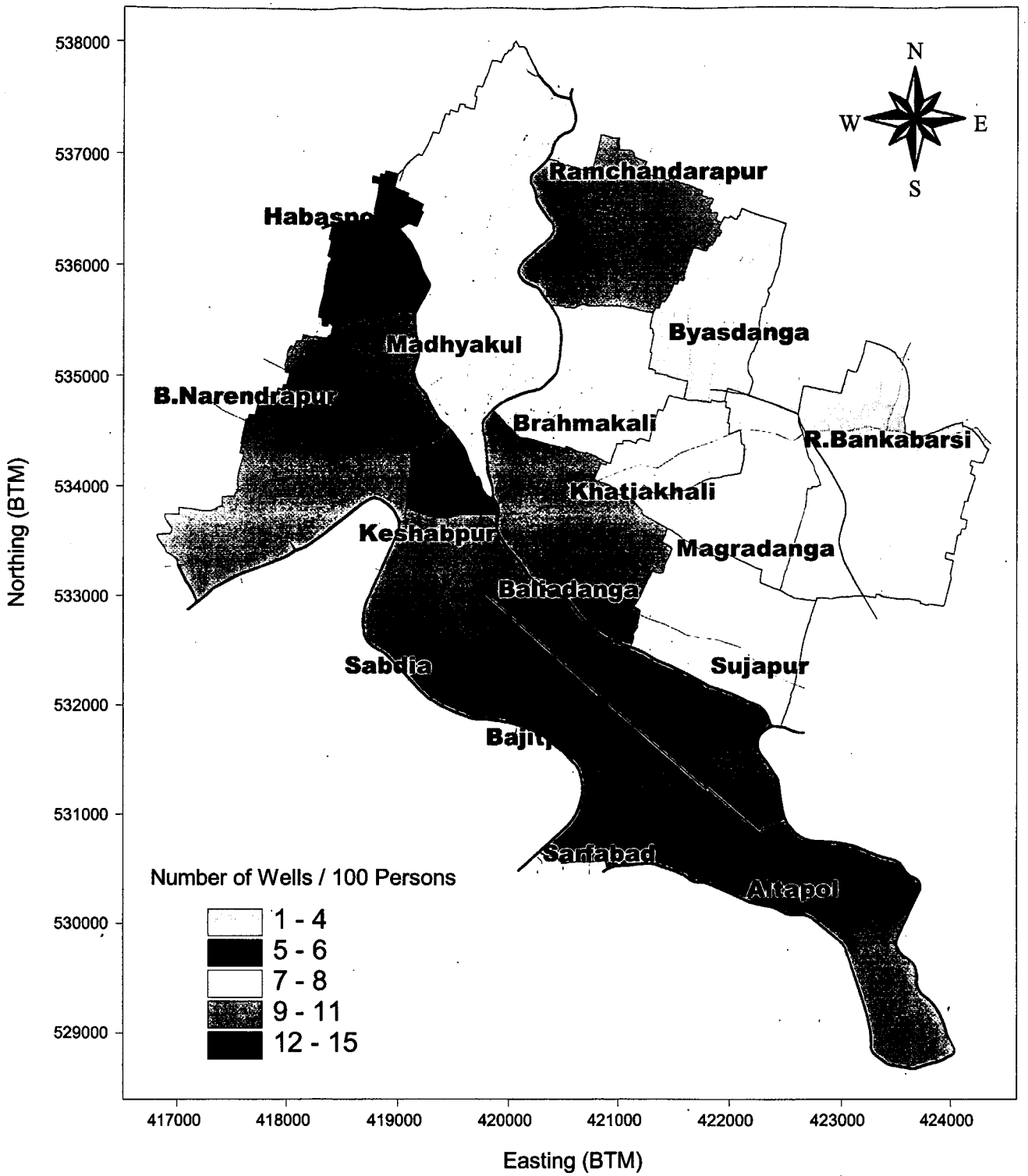


Figure 3.2.5	Number of Wells / 100 Persons in the Stusy Area
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

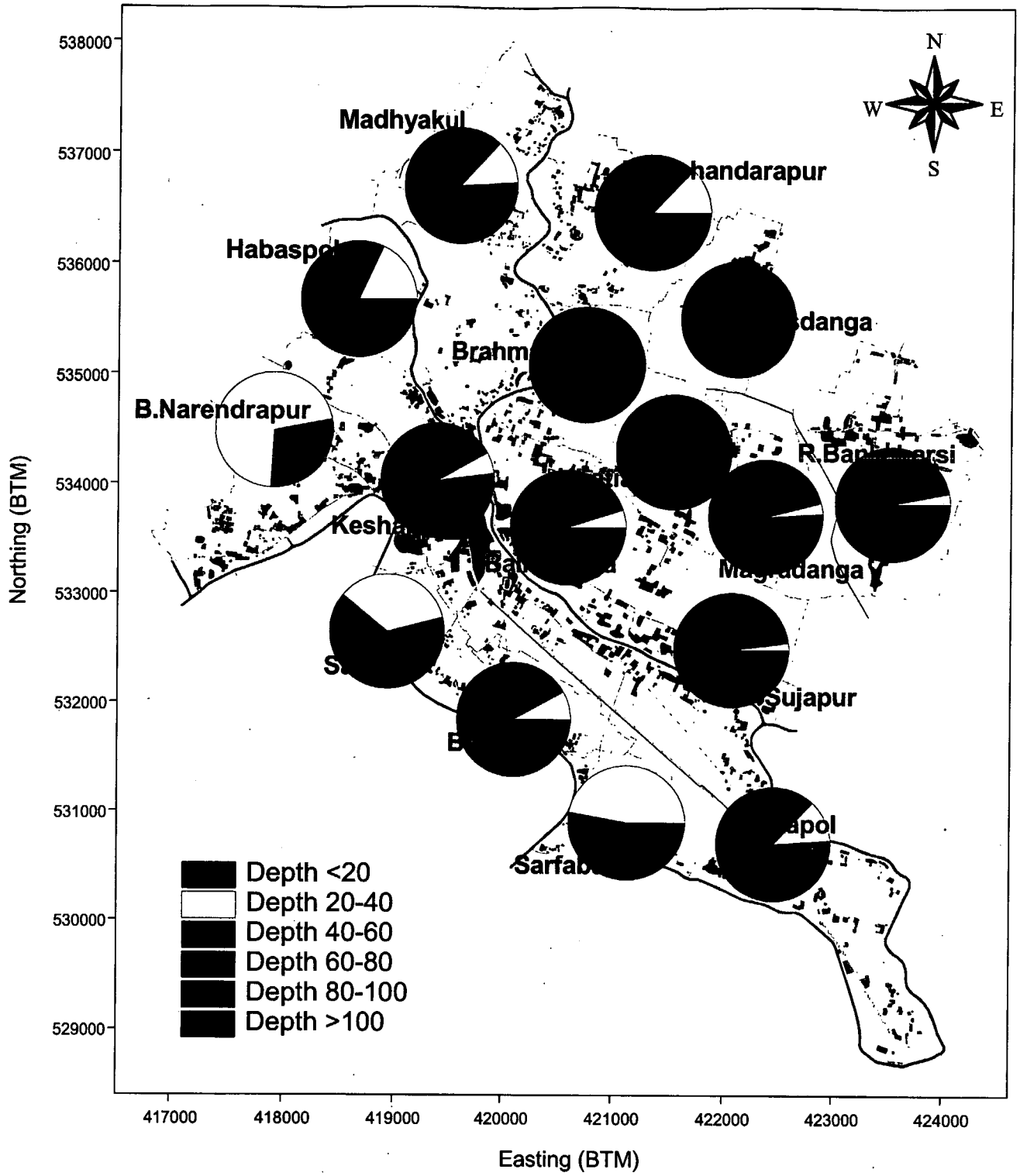


Figure 3.2.6	Well Depth Classification in the Study Area
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

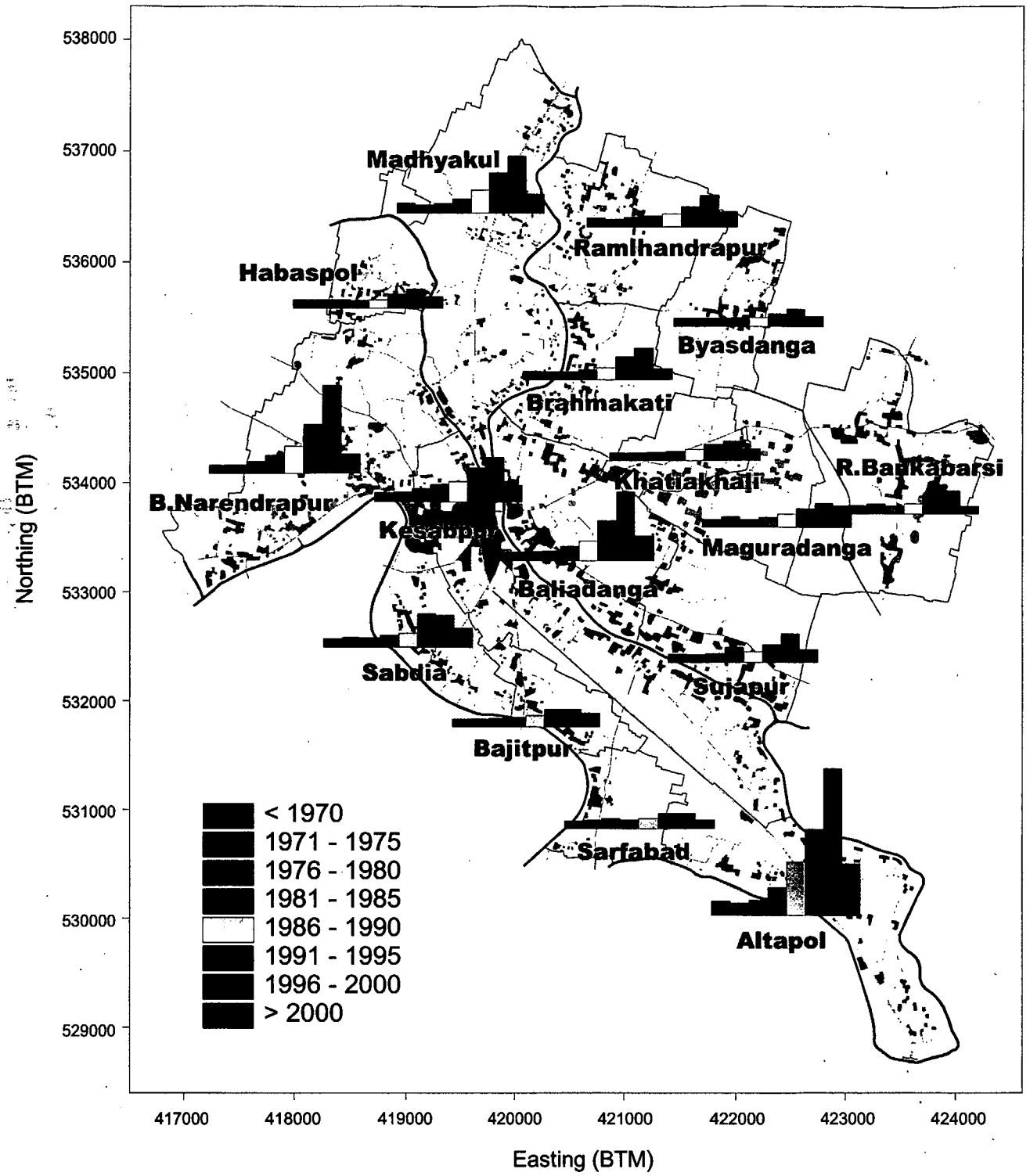


Figure 3.2.7	Year of Well Construction
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

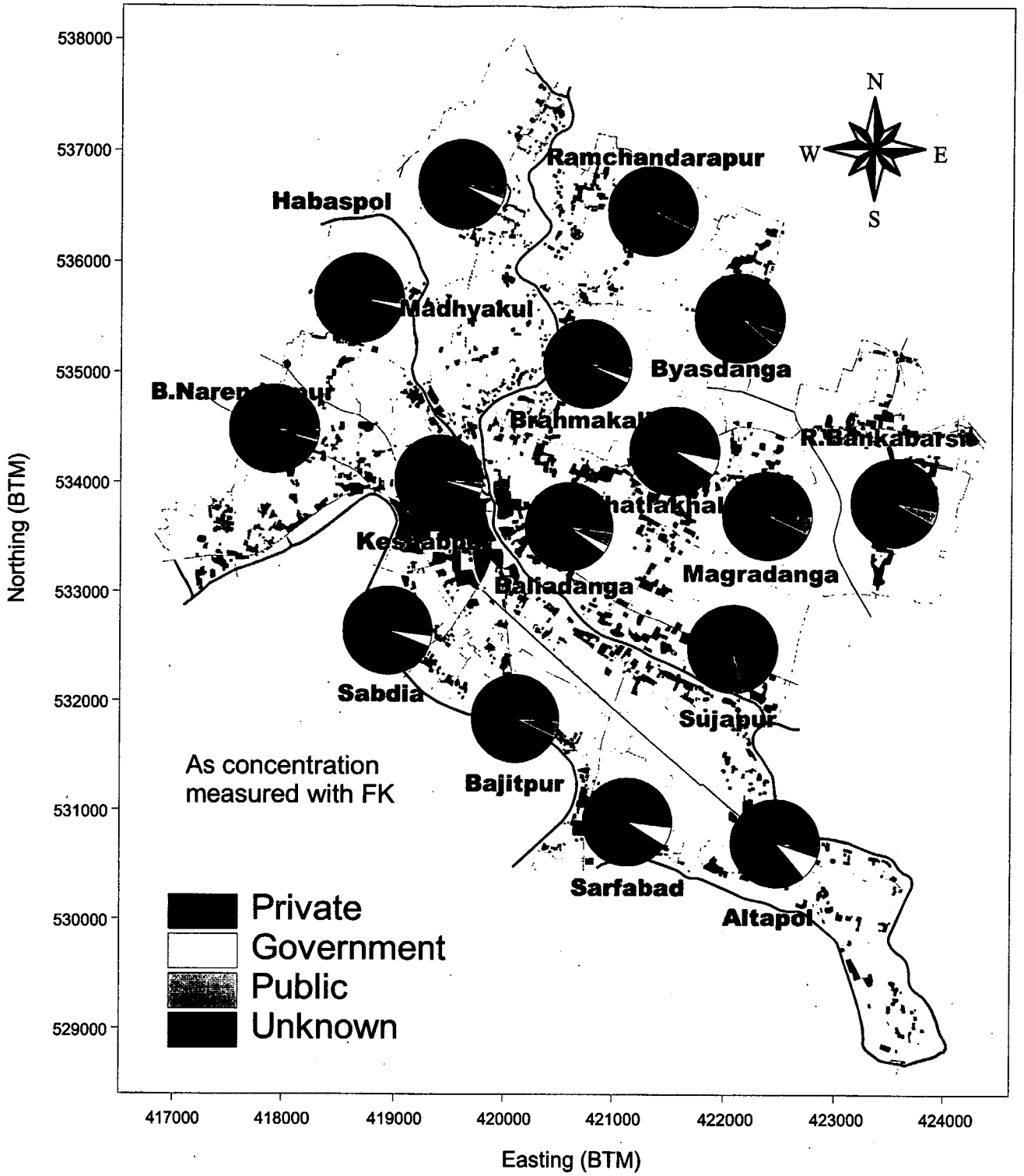
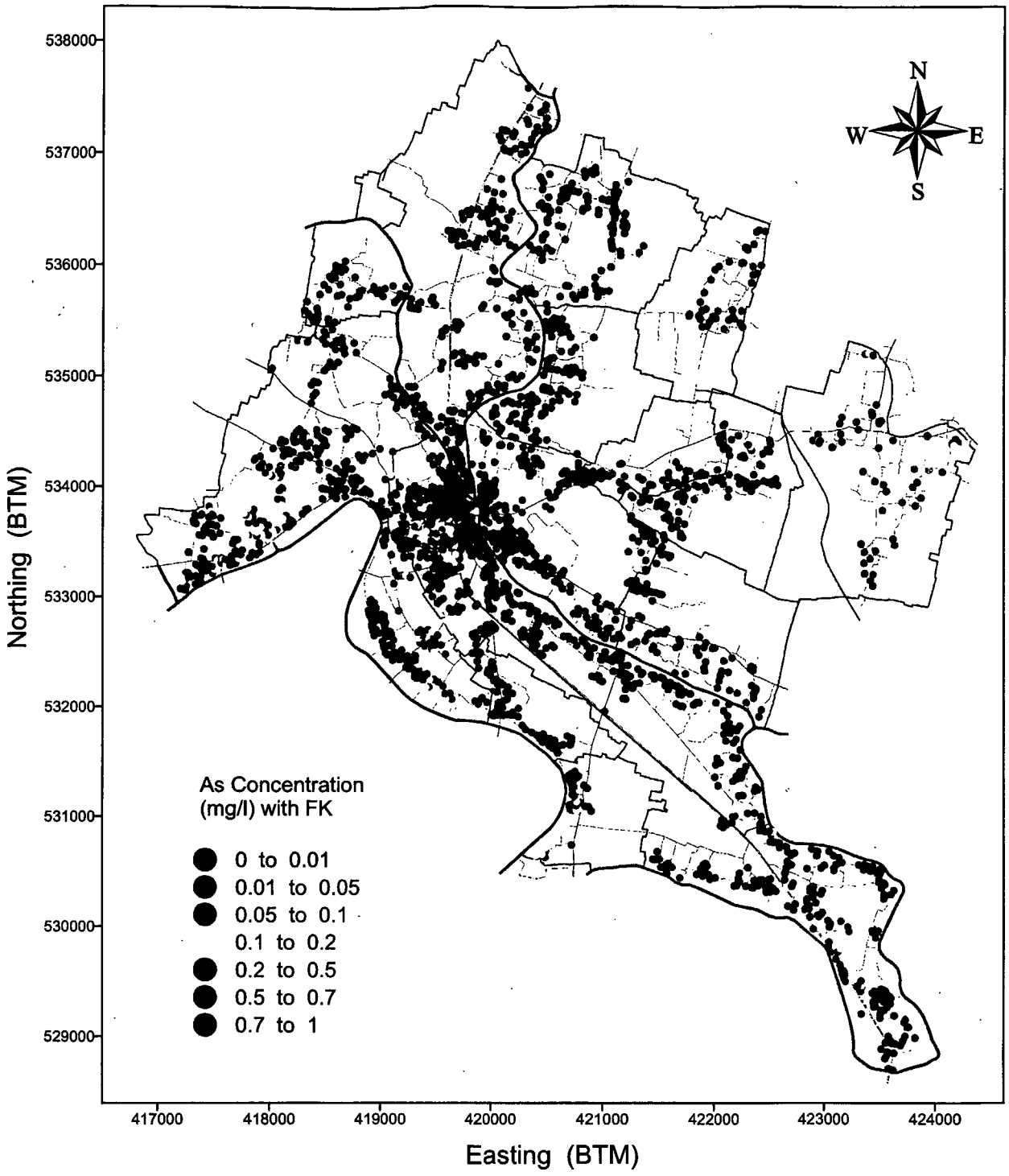


Figure 3.2.8	Classification of Well Owner
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	



[The arsenic concentrations of groundwater were measured at 3037 existing wells with Field Kits during the supplementary survey Jan. to Feb. 2002.]

Figure 3.2.9	Arsenic Concentrations at well points

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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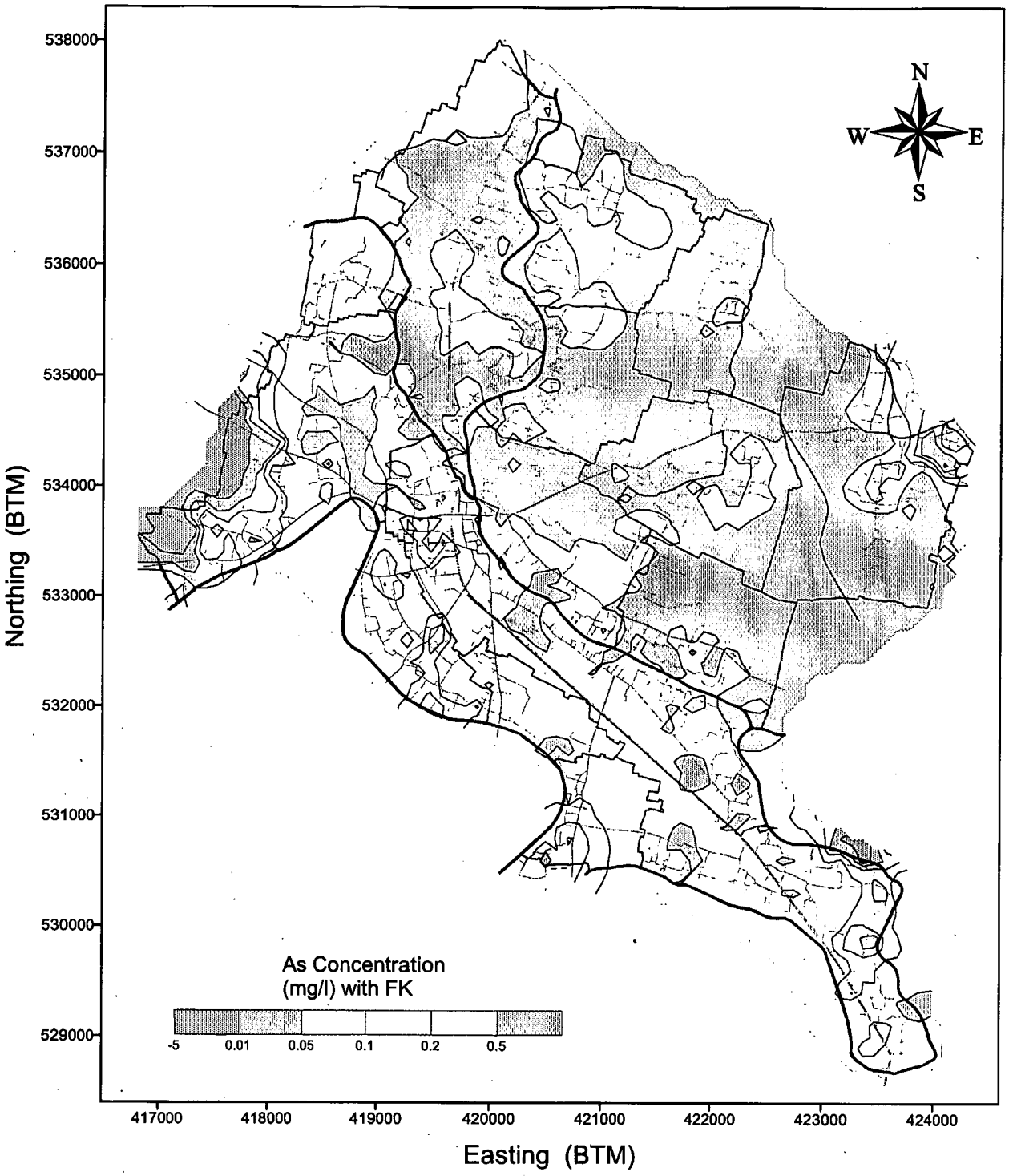


[The arsenic concentrations of groundwater were measured at 3037 existing wells with Field Kits during the supplementary survey Jan. to Feb. 2002.]

Figure 3.2.10	Map of Arsenic Concentration Measured with Field Kits
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

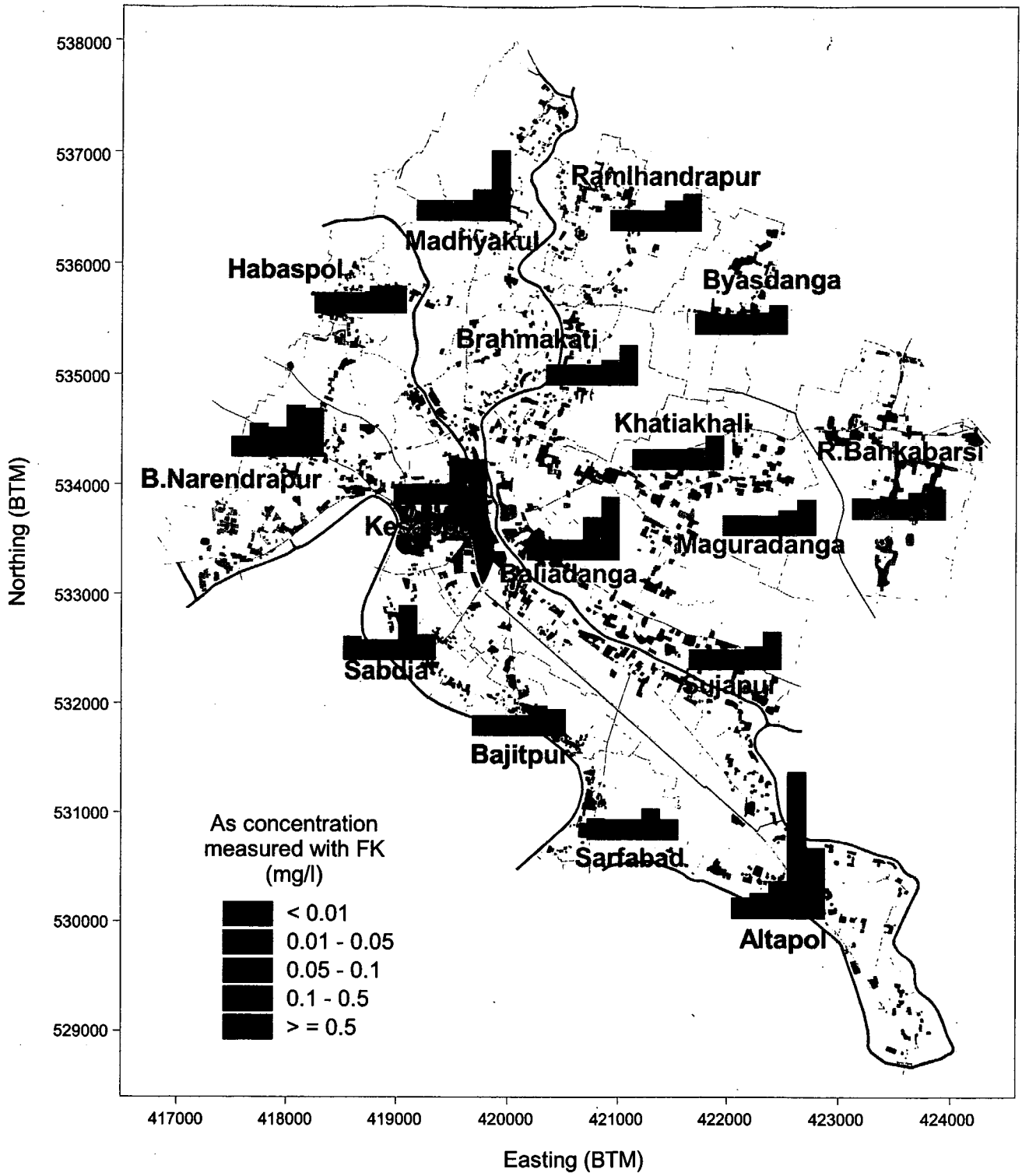
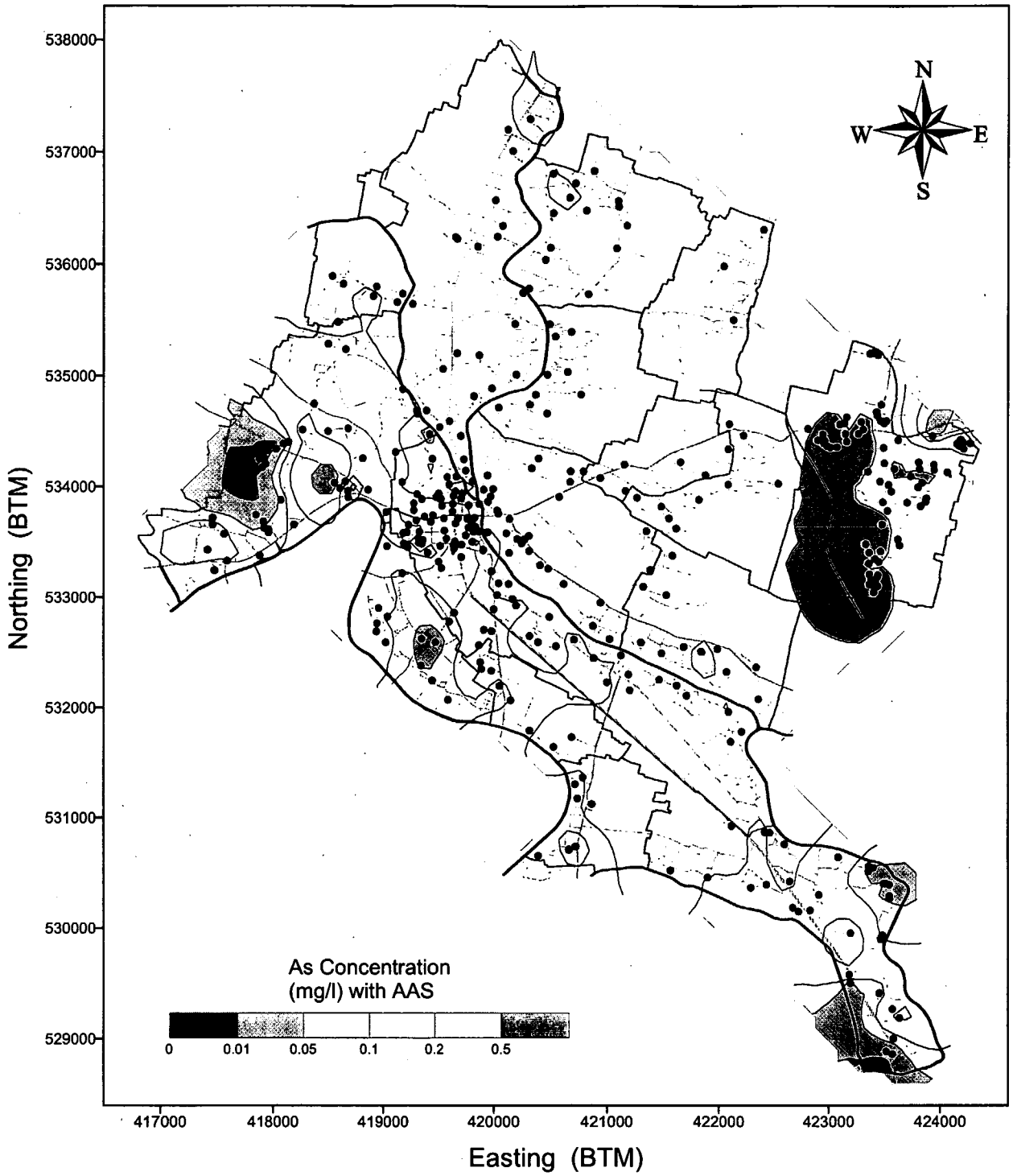


Figure 3.2.11	Histogram of Arsenic Concentration Measured with Field Kit
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	



[The arsenic concentrations of groundwater were measured at 379 existing wells with AAS during the supplementary survey Jan. to Feb. 2002.]

● Location of Measured Existing Well

Figure3.2.12 **Map of Arsenic Concentration Measured with AAS**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

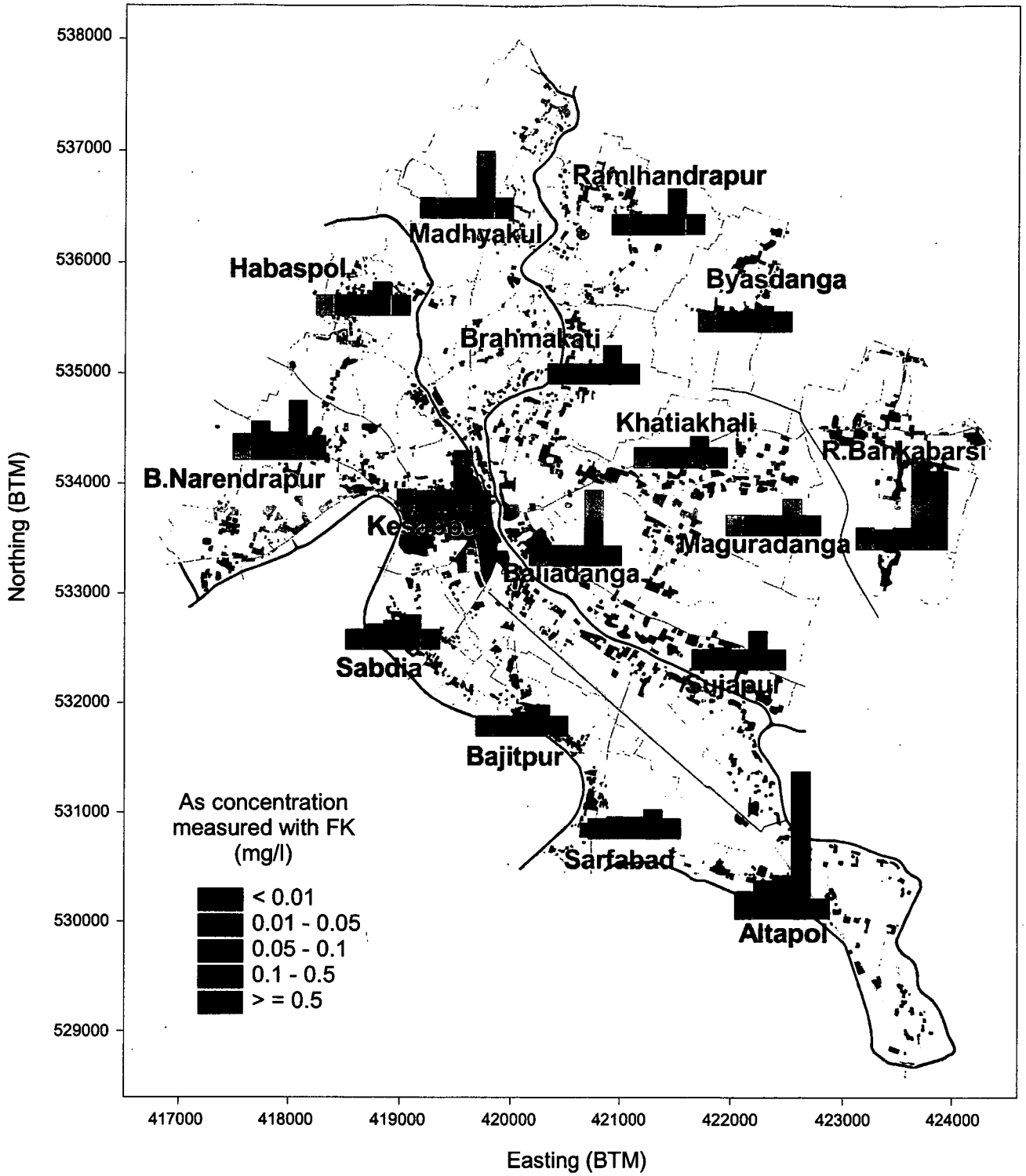
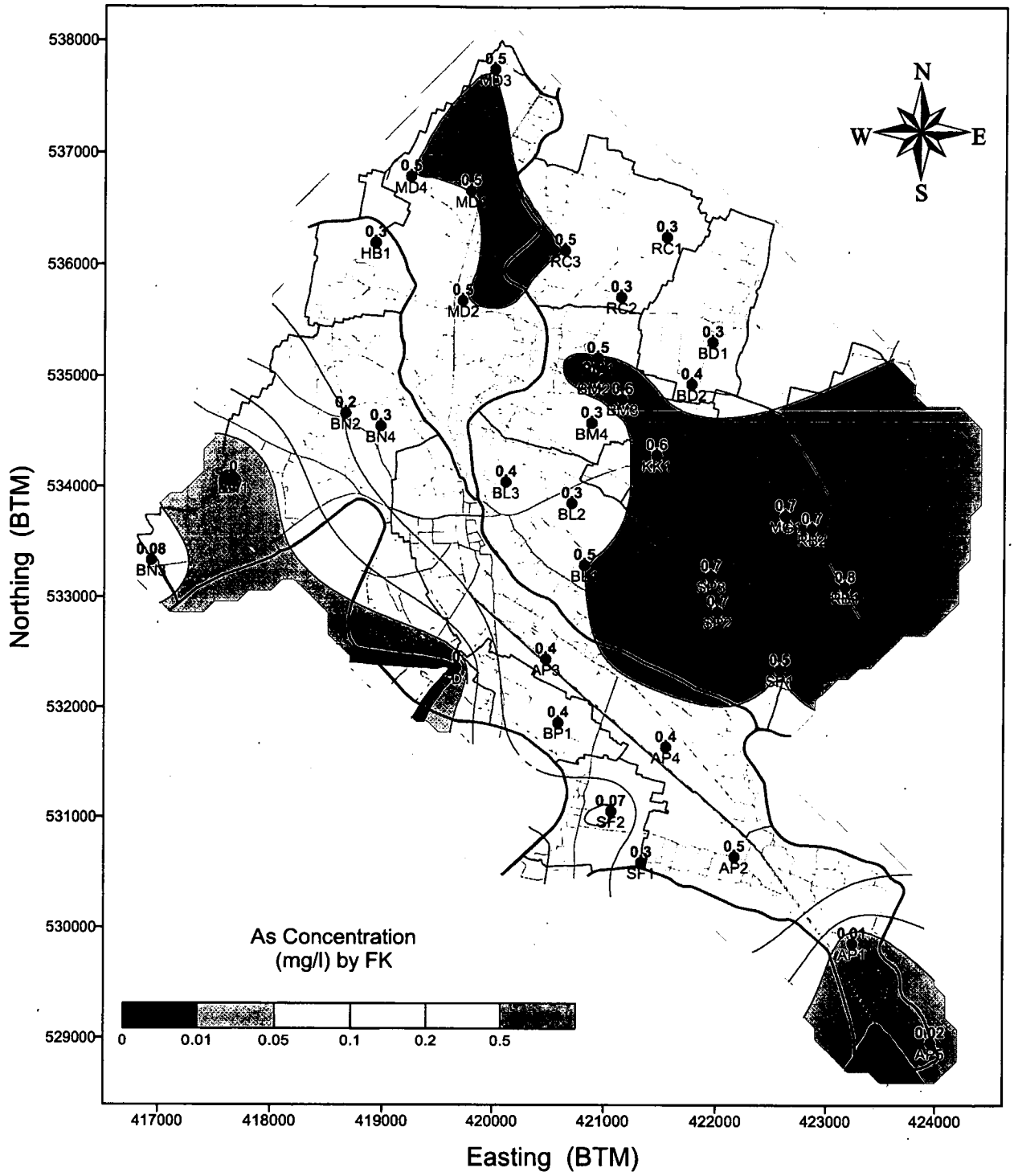


Figure 3.2.13	Histogram of Arsenic Concentration Measured with AAS
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	



[The arsenic concentrations of groundwater were measured at 37 existing irrigation wells by the AAN Field Kit during the supplementary survey Jan. to Feb. 2002.]

0.05 ● MD2 Existing Well with As Concentration (mg/l) by AAN Field Kit

Figure 3.2.14 **Arsenic Concentration Map of the supplementary survey aera Jan. to Feb. 2002)**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

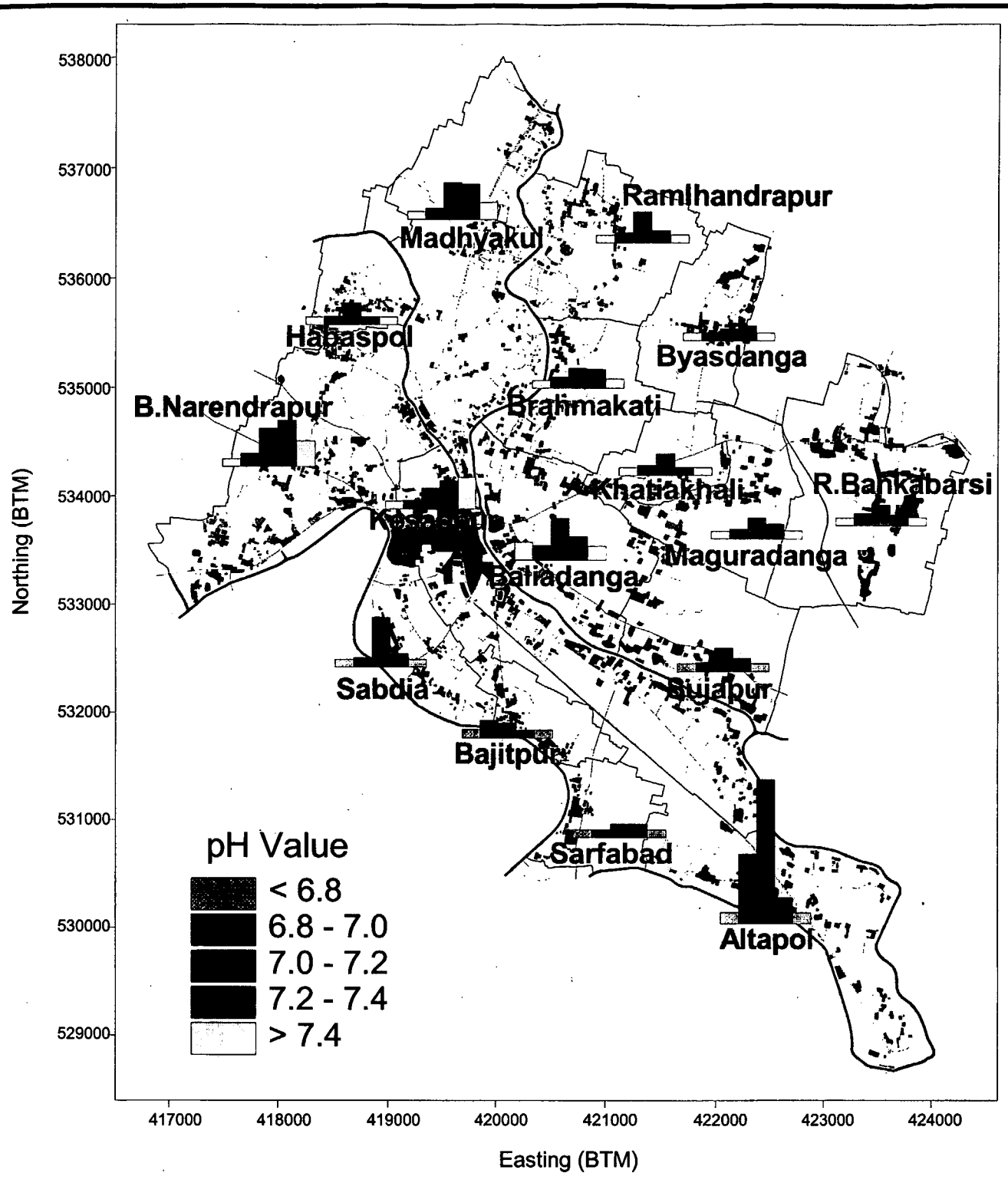


Figure 3.2.15	pH Histogram
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

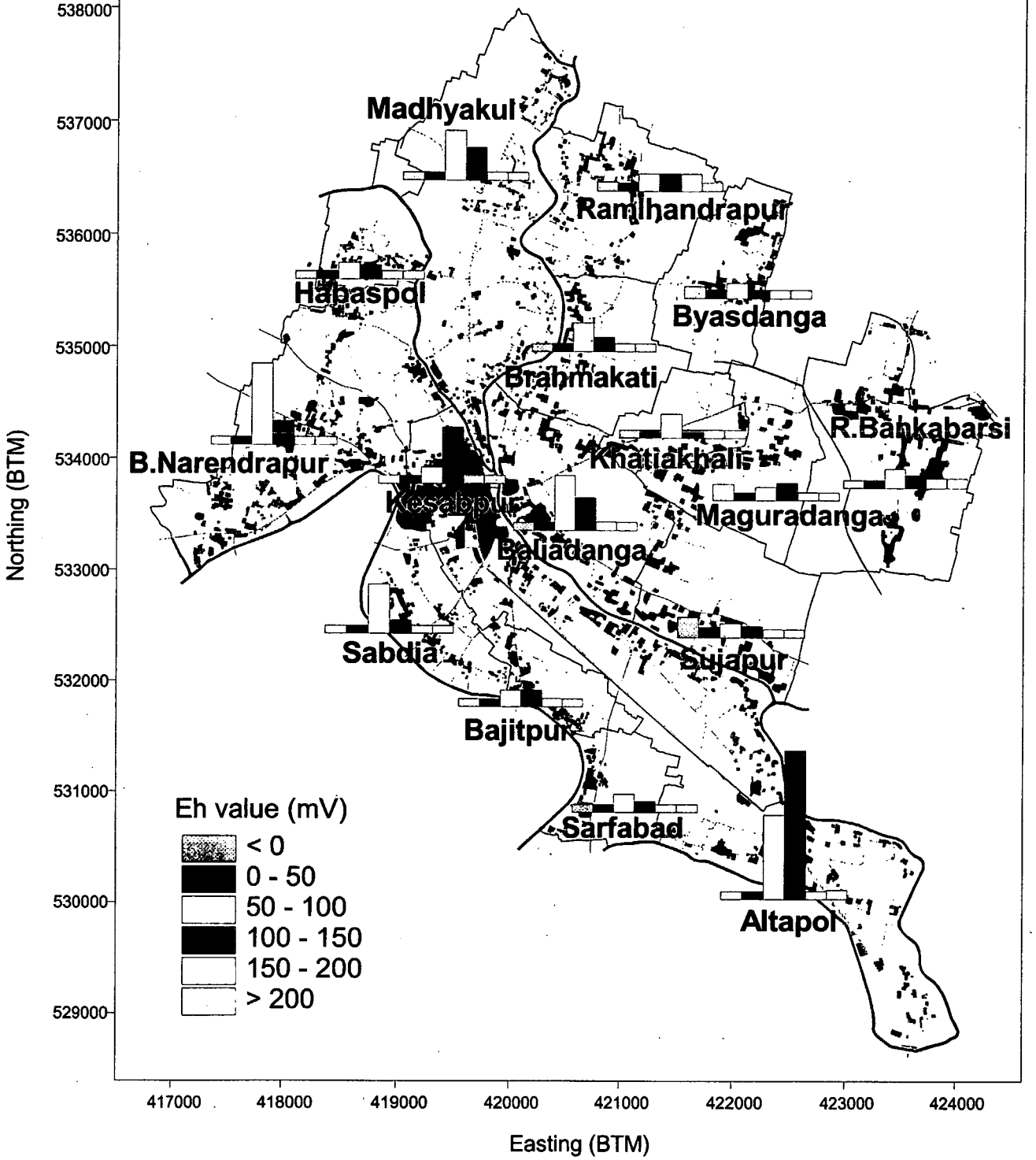


Figure 3.2.16	EC Histogram
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

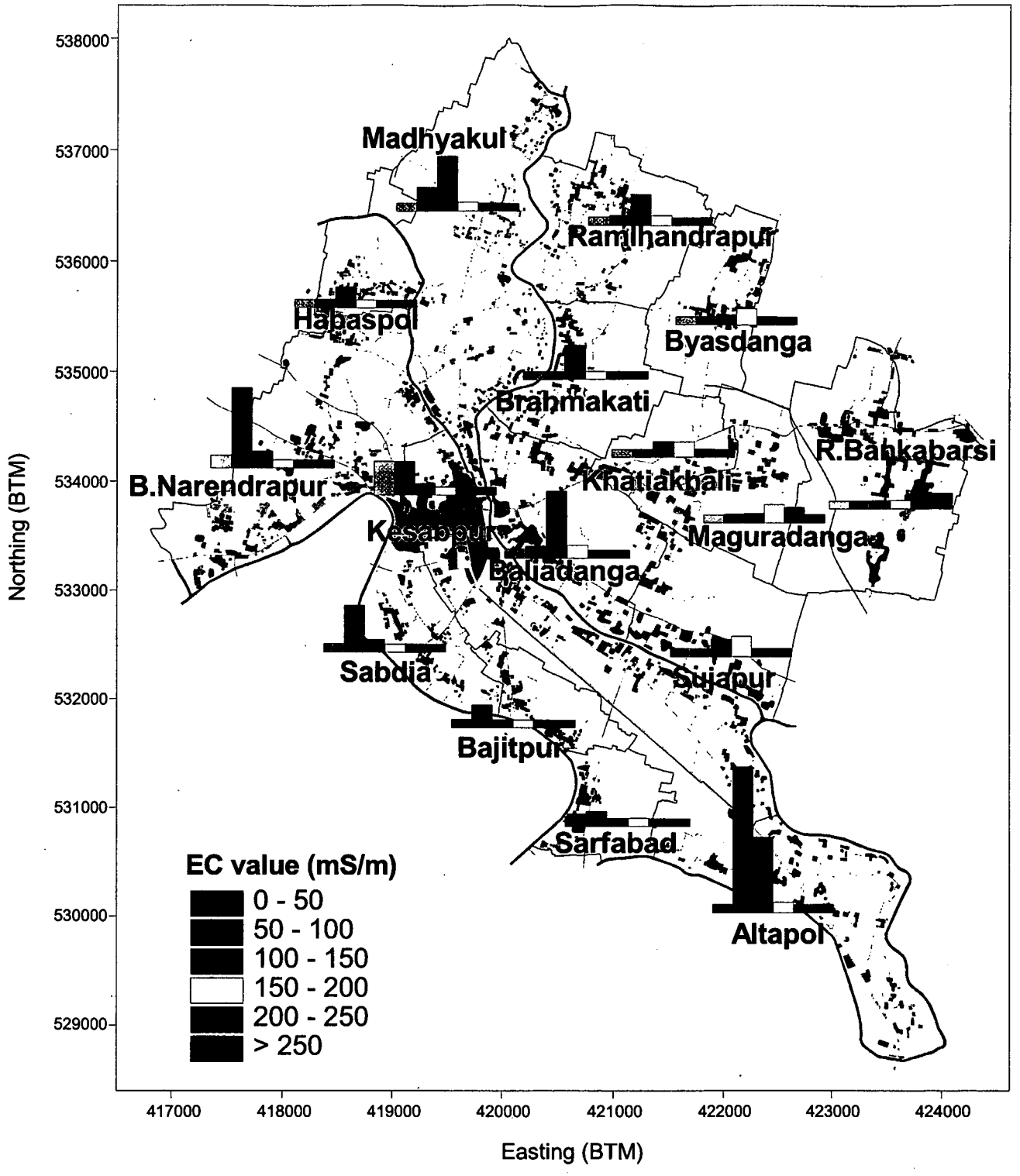
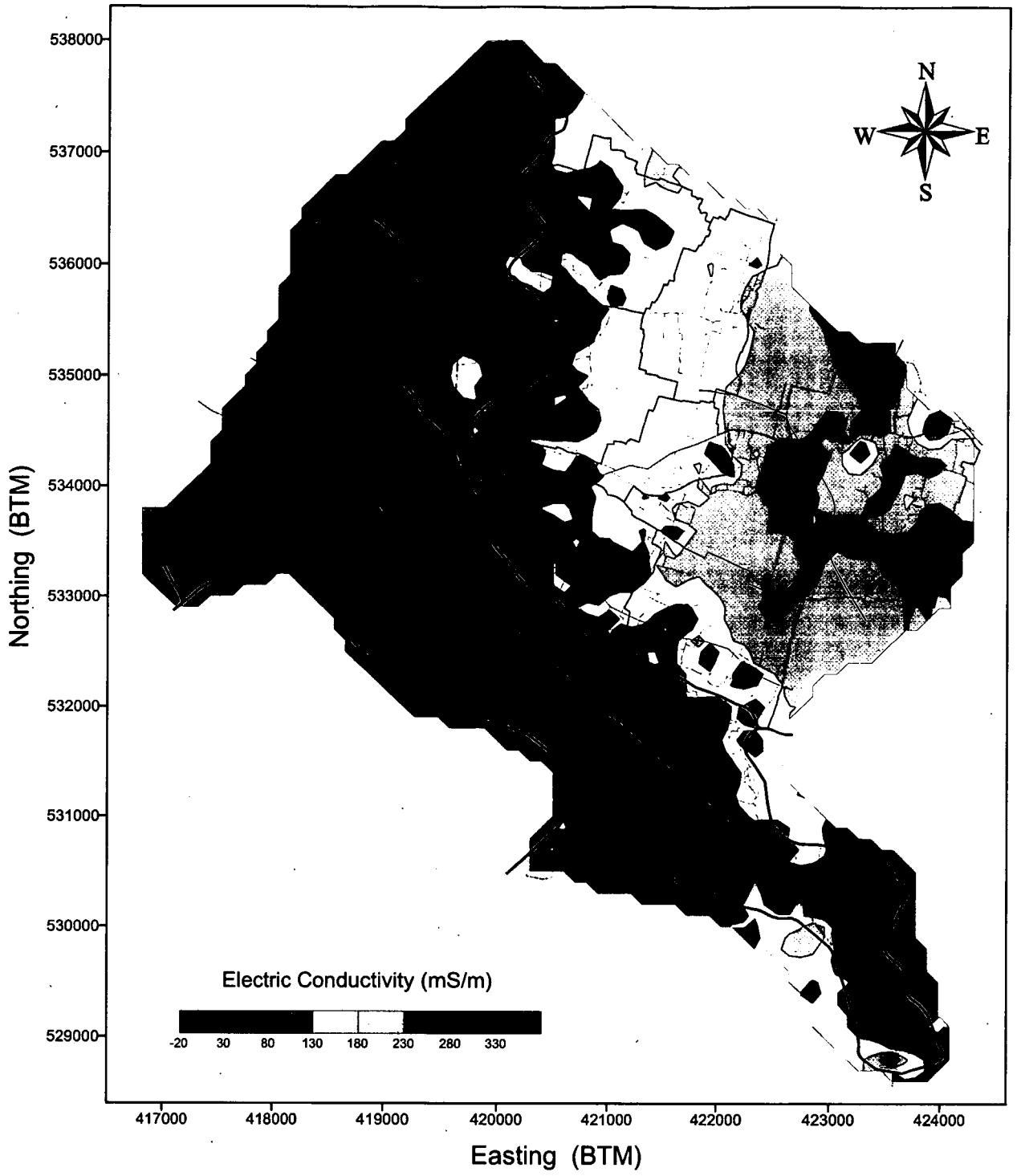


Figure 3.2.17	EC Histogram
The Stusy on the Groundwater Development of Deep Aquifers for Safe Drinking Water Supply to Arsenic Affected Areas in Western Bangladesh	
Japan International Cooperation Agency (JICA)	

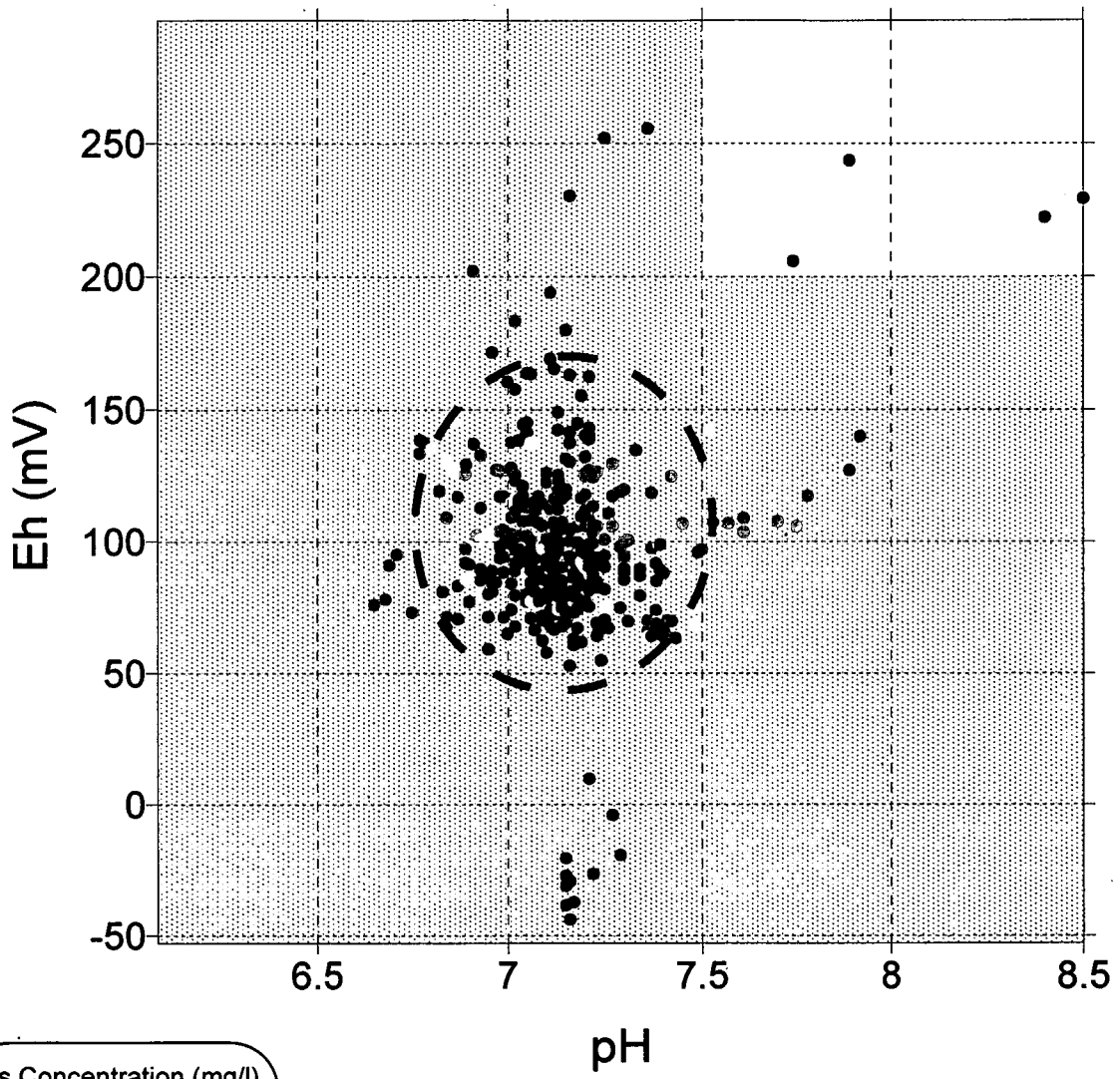


[Electric conductivity (EC) of groundwater was measured at 3037 existing wells with portable EC meters during the supplementary survey Jan. to Feb. 2002.]

Figure 3.2.18	EC values measured at the existing wells

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



As Concentration (mg/l)
Analyzed by AAS

- 0 to 0.01
- 0.01 to 0.05
- 0.05 to 0.1
- 0.1 to 0.5
- 0.5 to 1

High Arsenic Concentration Zone

[The ORP and pH values were measured at existing wells from January to March 2002 by potable ORP meter and potable pH meter.
The arsenic concentrations were analyzed by the AAS in Jhenaidah Laboratory.

The reading ORP values were converted into Eh values by:
Eh (mV) = [ORP meter reading value (mV)] - 0.71978 * [Temp (deg-C)] + 224.363]

Figure 3.2.19 **Eh-pH-As Relations of Existing Wells of Supplementary Survey**

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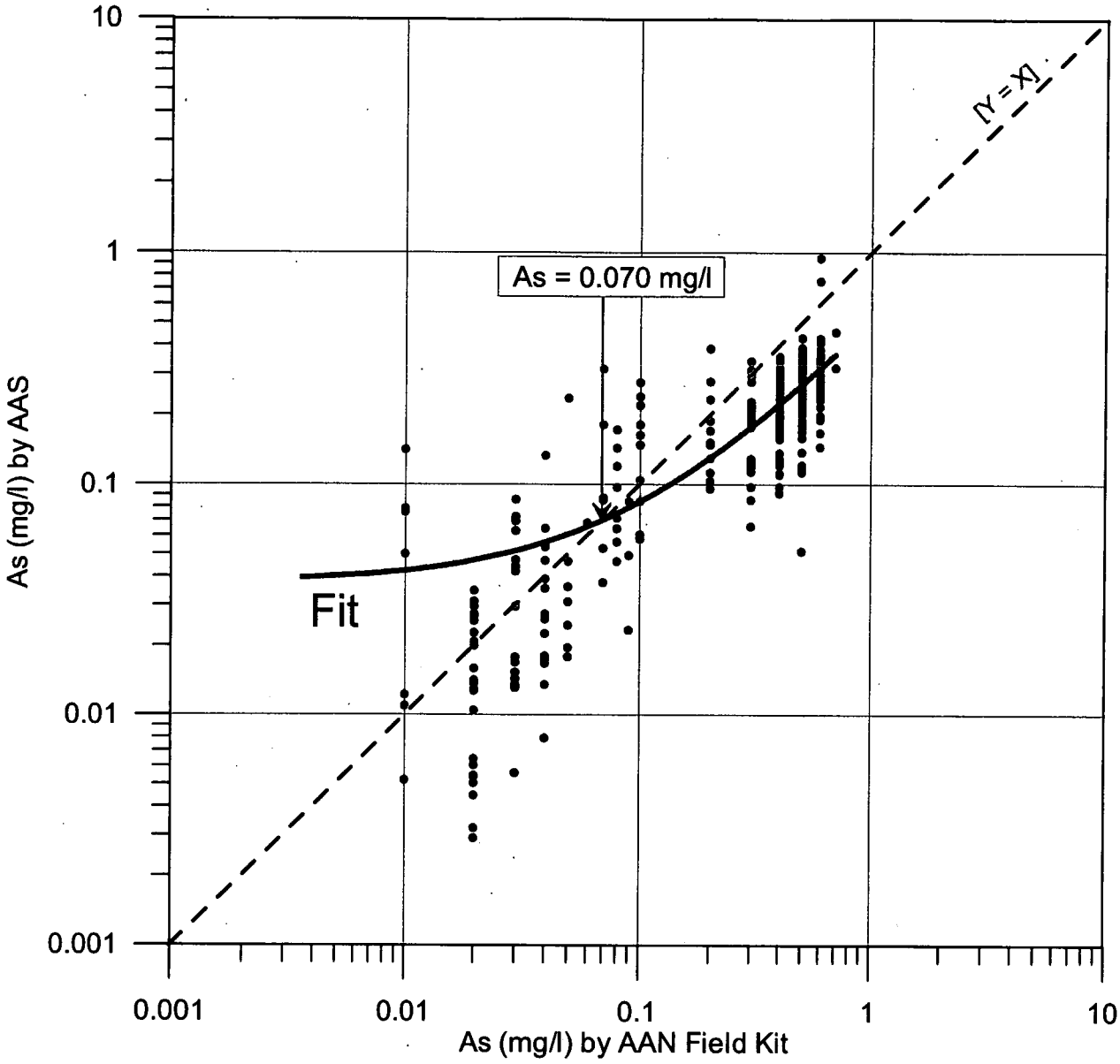

Fit Results

Fit : Linear
Equation Y = 0.4654463052 * X + 0.03759712448
Number of data points used = 349
Coef of determination, R-squared = 0.602472

(The arsenic concentrations were measured in Screening Survey in February to March 2002.)

Figure 3.2.20	Comparison of As Concentrations Measured by FK and AAS by Log-Log Plot
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
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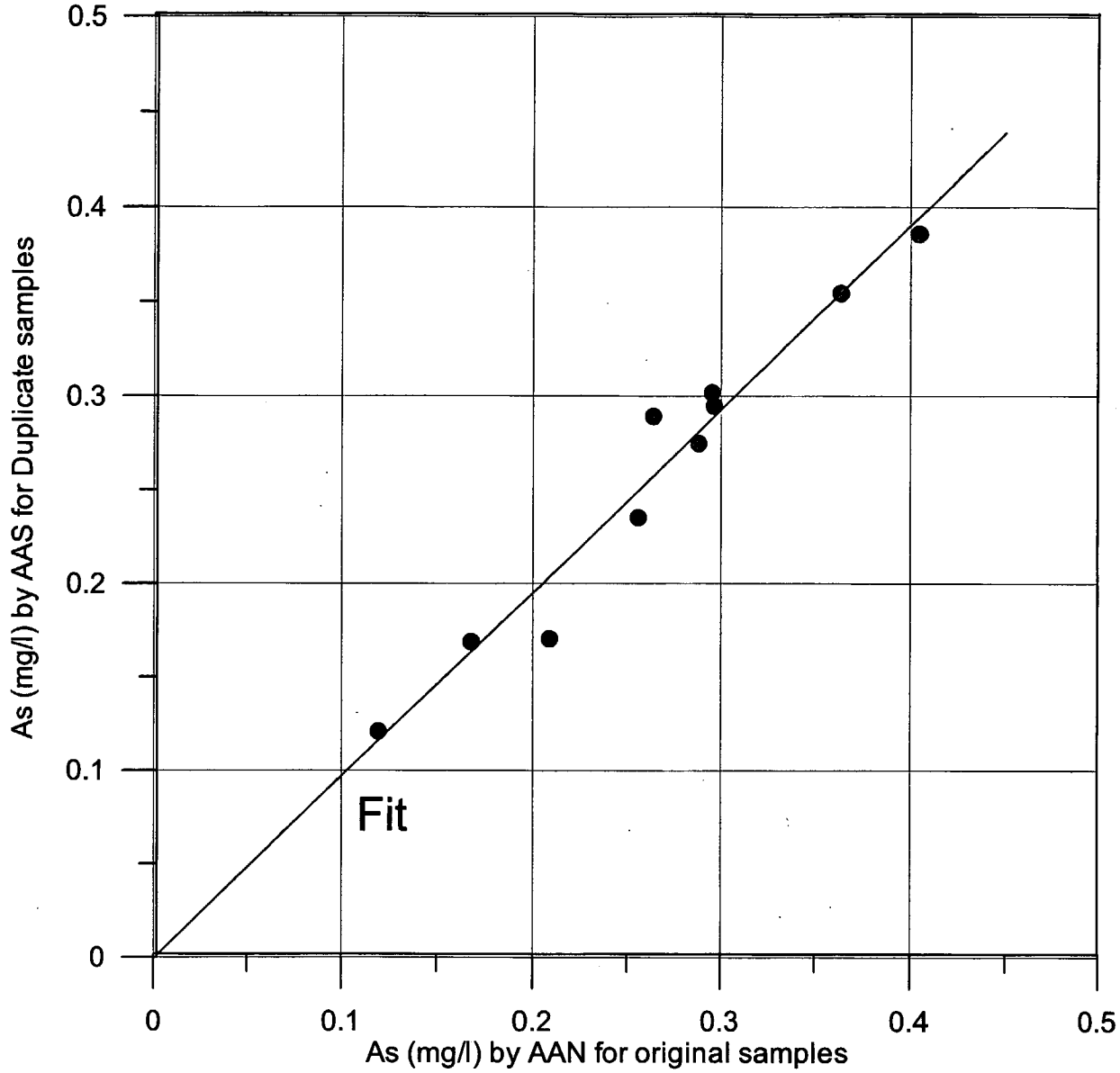

Fit Results

Fit : Linear
Equation Y = 0.9780473335 * X - 0.0009566045555
Number of data points used = 10
Coef of determination, R-squared = 0.95866

(The arsenic concentrations were measured in Screening Survey in February to March 2002.)

Figure 3.2.21	Results of Duplicates analysis of As for Screening Survey by AAS
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
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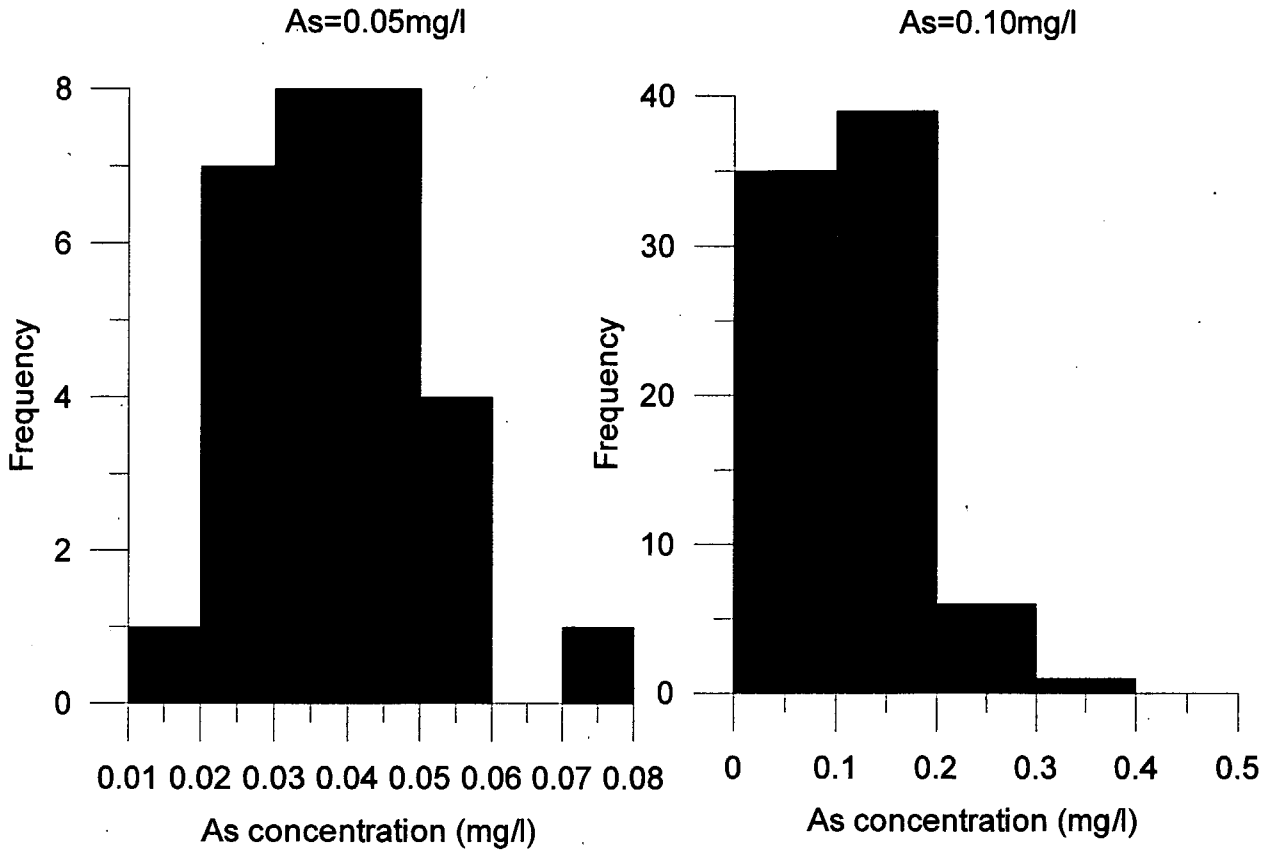

(The arsenic concentrations were measured in Screening Survey in February to March 2002.)

Figure 3.2.22	Results of Duplicates analysis of As for Screening Survey by AAS

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CHAPTER 4

WELL DRILLING AND PUMPING TEST

Supporting Report 2

CHAPTER 4 WELL DRILLNG AND PUMPING TEST

4.1 Observation Well

4.1.1 Site Selection

The drilling site was selected in consideration of the following:

(1) The aquifer, which contains no groundwater contaminated with arsenic, exists within the drilling site and is 300m in depth.
(2) It is possible to maintain the road for the transportation of the drilling machine and other large material and to keep a wide space for the drilling works.
(3) The drilling site is located in a rural area.
(4) The circumstances of arsenic concentration are conspicuous in the survey area and villagers take advantage of many shallow tube wells.

Explanation of (1) Item: Geological profiles in the Keshabpur area (see Figures 4.3.2 to 4.3.4) indicate the criteria of selection. The aquifer that shall supply the safe groundwater consists of coarse deposits, and it is predicted that this aquifer is at a depth of more than 300m in the south of Kesabpur Mouza. The results of the core boring at R. Bankabarsi mouza indicate that the strata at a depth of 300m consists of silt faces, but not the coarse faces for an aquifer. At R. Bankabarsi mouza, the thin layers of fine to coarse sand are seen from 200 to 300m in depth. These aquifers aren't in the surroundings of Kesabpur mouza because they aren't continuous in the direction from east to west. Since there are no existing data on the west of Kesabpur mouza, hydogeological structures haven't been confirmed in these areas. Based on hydrogeological considerations, the target for the drilling sites is the north of Kesabpur mouza, and is a deep aquifer, for example 300m in depth, in the survey area. Otherwise, another target for the drilling sites is in area between Kesabpur mouza and R. Bankabarsi and is the aquifer in the surroundings of 250m in depth. In any case, it was the north of Kesabpur mouza that was selected out of these two targets because the aquifers of 250m in depth in R.Bankabarsi mouza probably don't continuously distribute in the direction of Kesabpur mouza. The target mouzas that were selected in the north area of Kesabpur mouza were a part of Baliadanga and Kesabpur, Brahmakati, Byasdanga, Madhyakul, Habaspol and Ramlhandrapur mouza.

Explanation of (2) Item: As a result of the field survey, Brahmakati and Ramlhandrapur were selected for the target for drilling site.

Explanation of (3) Item: Four mouzas were selected besides Kesabpur, a part of Baliadanga and Madhyakul mouza.

Explanation of (4) Item: Arsenic concentrations in all mouzas of the survey area have values higher than Bangladesh Standard values of the groundwater quality. The number of wells in

Byasdanga and Habaspol mouza was few compared with other mouzas.

Bramakati and Ramlhandrapur mouza were consequently given priority for the drilling site. However, Ramlhandrapur mouza exists at the northern edge of the study area. The Bramakati mouza is located in a more central part of the target area than the Ramlhandrapur mouza. In the end, the JICA study team selected Bramakati mouza for the drilling site (see Figures 4.1.1 and 4.1.2).

4.1.2 Drilling Machine and Configuration

The drilling machine at the site is classified as a rotary drill type, spindle machine with Hydraulic Feed type (Photo1). Machine item was TBM-07. This drilling machine has the capacity of drilling to approximately 500m in depth. The rods were HQ type. The bits made use of Blade and Tricone bit alternatively. The bits had diameters of 20 to 24 inch, 14 inch and 9 inch (Photo2). The Derrick Mast was about 13m in height and corresponded to the drilling depth of 300 to 600m (Photo3). The preparations, which included construction of a concrete base and setting up of the Derrick Mast and another materials with casing, were carried out before drilling. These works took five days. Drilling of 300m in depth had been carried out from the 13th to the 26th of February. Figure 4.1.3 shows the drilling progress.

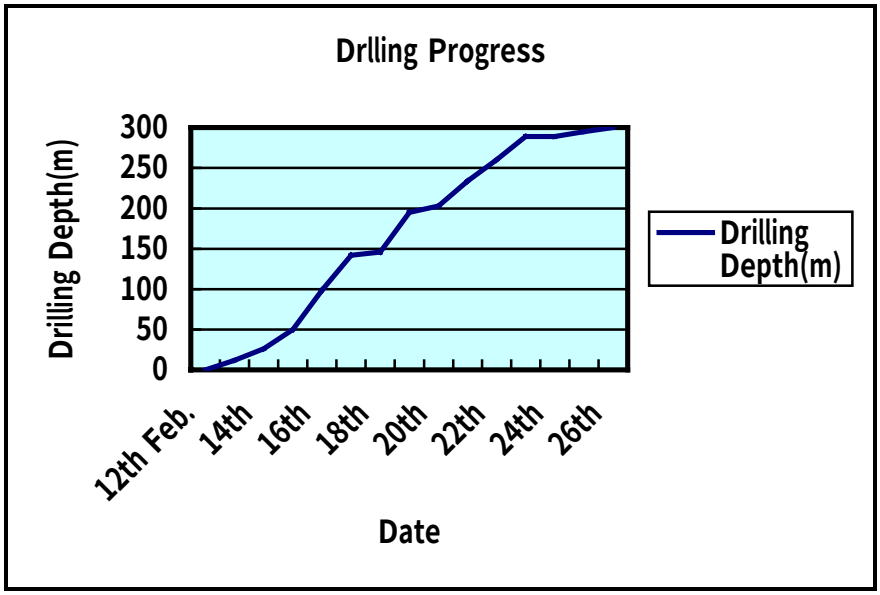

Figure 4.1.3 Drilling Progress

Table 4.1.1 shows the location of the drilling site.

Table 4.1.1 Location of drilling site

District	Upazila	Mouza	Well Type	Well No.
Jessore	Keshabpur	Brahmakati	Observation Well	Js-OW-1

Photo2 Blade bit

Photo1 Drilling Machine of Hydraulic feed type

Photo2 Tricone bit (9 inch)

Photo3 Derrick Mast

4.1.3 Results of Drilling

1) Observation of Cutting samples

Core samples weren't taken during the well drilling until 300m in depth, but cutting samples were collected one sample per one meter. Since boring slime was taken with drilling mud, the

observation of cutting samples was carried out after washing the samples (Photo1). Figure 4.1.4 shows the results of the observation in slime sheets. The characteristics of observation results are as follows:

① Man-made ground (Surface soil) exists until 2m in depth (the number is the depth from the surface) with blocks and showing yellowish color.

② Peat layers are seen at 9 to 11m, 18 to 20m, and 36 to 37m in depth.

③ Very fine to fine sand is mainly distributed until 66m with wood fragments, nodules and shell fragments.

④ Medium sand is contained until from 66 to 116m in depth continuously. Fine gravel is mixed in the sand at 80, 98, 105 and 108m in depth.

⑤ Shell fragments are mixed until from 66 to 165m in depth, especially from 137 to 165m with wood fragments.

⑥ Very fine to fine sand is seen until from 116 to 165m. Silt layers are sometimes contained and interbedded very fine sand and fine sand is underlying until 287m in depth. Wood fragments are contained between 227 and 228m in depth.

⑦ Medium to coarse sand interleaving fine gravel is distributed from 287 to 300m in depth with fine gravels.

Photo1 Handling of Cutting sample

2) Geophysical Logging

Geophysical logging carried out was electrical logging, self-potential (SP method) and natural γ. The electrical logging takes advantage of the resistivity method by two-electrode method. Electrode spacing has the long (64 inch) and short (16 inch) separation. Figure 4.1.5 illustrates a columnar section and results of the geophysical logging. The result of electrical logging slightly tends to take the gentle curve due to the reference of drilling mud. However, logging curves

roughly correspond with the observation results of cutting samples. In particular, the moment faces of very fine to fine sand change into coarse sand from 287m in depth, the low resistivity values change into high values sharply. Resistivity shows from 20 to 60 Ωm on the whole. Silt layers indicate the resistivity values of 20 Ωm. Resistivity values of very fine to fine sand have from 20 to 30 Ωm, coarse sand to fine gravels resistivity values also correspond with 40 to 60 Ωm. The SP curve is in the negative range, and a significant change isn't seen on the whole. However the positive SP curve changes into negative at 60m in depth and slight changes in the SP curve are partly recognized between 180 and 300m in depth. The natural γ curve indicates the difference of the strata density; its measurement unit is cps(counts per second). A significant change in the curve isn't recognized on the whole. However slight changes in the number of counts are seen at 10, 50, 65, 90, 120, 210 and 287m in depth. The curve changes of 65, 120, 165 and 287m correspond to the boundary of layer faces.

3) Casing Program

The casing program was designed based on the results of electrical logging and observation of cutting samples (see Figure4.1.6). Table 4.1.2 shows the main items of the casing program.

Table 4.1.2 Items of Production well

Drilling Depth (m)	Well Depth (m)	Screen Depth (m)	Screen Length (m)	Casing Program (m)	Gravel Pack (m)	Sand Pack (m)	Bentonite Seal (m)	Cement Seal (m)
300	299	286.28-298.00	11.72	14in:0-29.45 6in:29.45-300	281-300	279-281	277-279	265-270 35-40

Coarse deposits for aquifers existed with the different depth. These aquifers are divided by silt layers, and aquifer units are formed. Therefore, screen pipes should be set paying attention to the aquifer units. Since the shallow aquifer (from 60 to 116m in depth) is contaminated by arsenic, according to the results of the screening survey, the target of screens is the deep aquifer. Fortunately, coarse deposits are seen at the lowest part of drilling depth. So the screen pipes were installed from 287 to 298m in depth. After installing the casing pipes and screen pipes, gravel packing and sealing by fine materials were carried out from the bottom of the casing to 265m in depth. Above the cement packing, clay was filled up to 40m in depth. Furthermore, upper cement packing was done at 35 to 40m in depth in order to prevent seepage from upper aquifers.

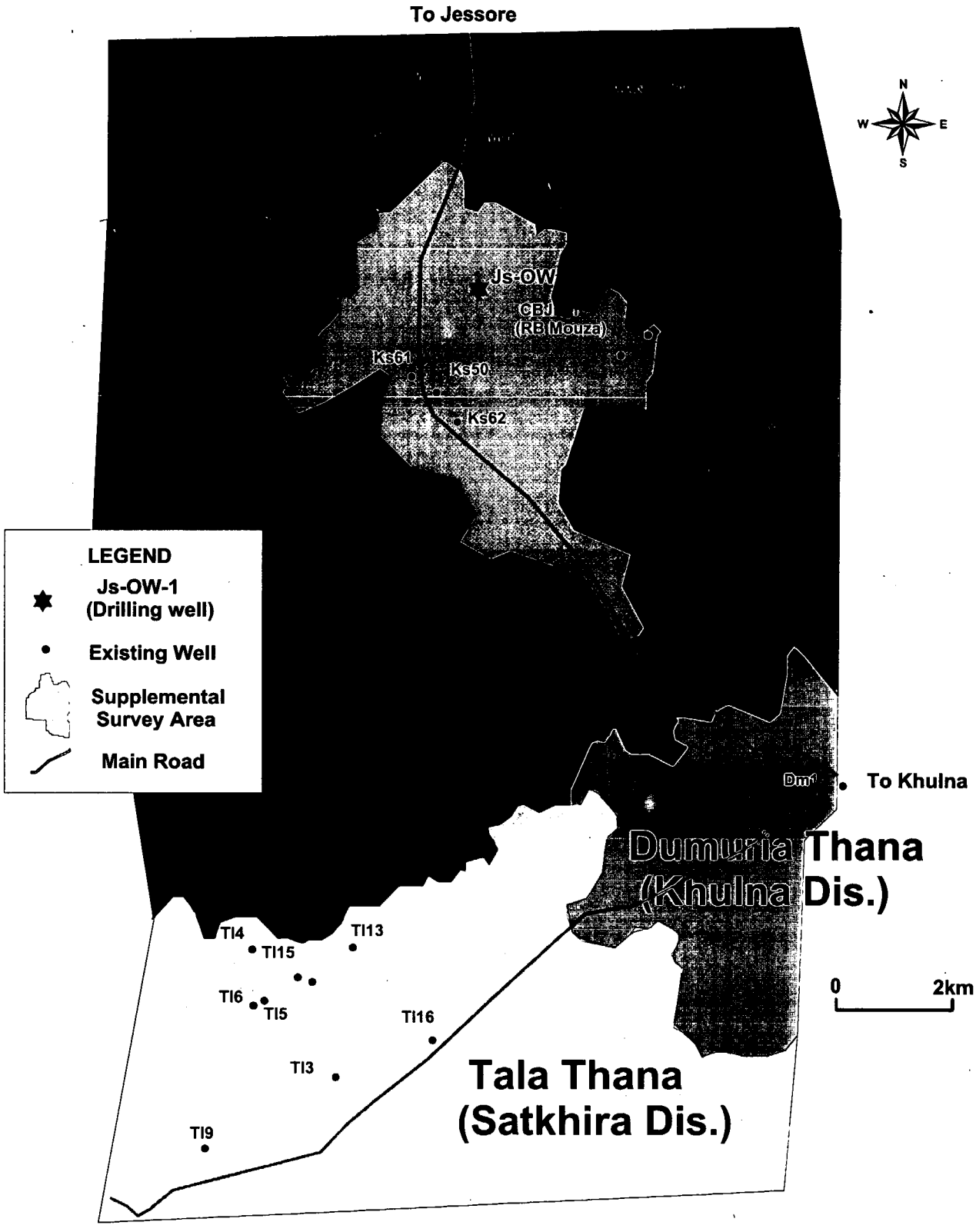

Figure 4.1.1	Location Map of Observation Well
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

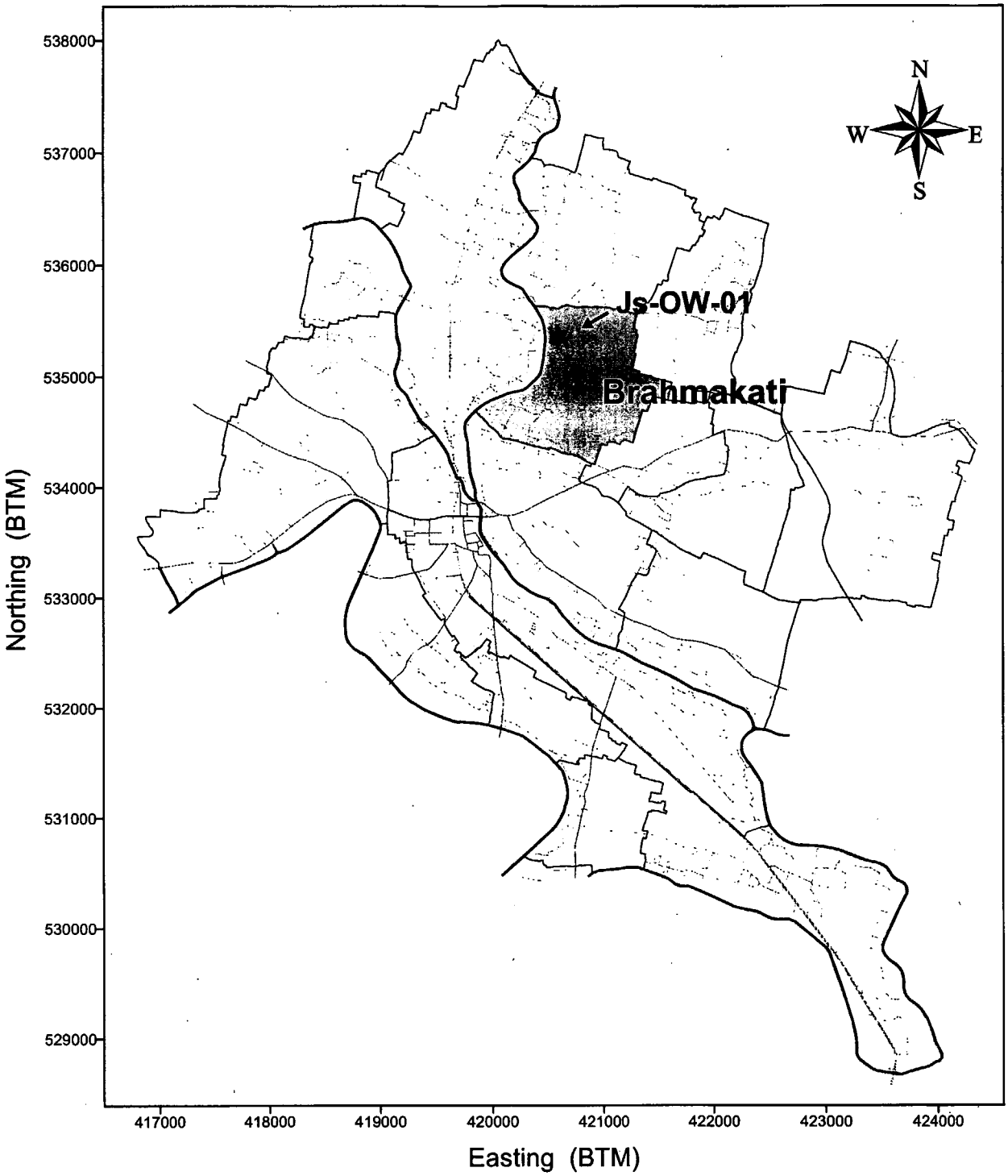


Figure 4.1.2	Location Map of Observation Well
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

No. 1

Geological Log Sheet *(JICA Study Team) by cutting samples*

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana	Keshabpur	Drilling No.	Js-OW-1
Union	Keshabpur	Depth	0 m ~ 50 m
Mouza	Brahmakati		
Location		Recorder	K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
0					
		silt	grayish yellow	surface soil with brick fragments	2
		sandy silt	grayish olive		3
5		silt	dark grayish yellow	wood fragments (max. 6mm) 8-9 m shell fragments	9
10		peat	brownish black	wood fragments (max. 14mm)	11
15		silty v.f.s	grayish olive	wood & shell fragments	18
20		peaty v.f.s	olive gray	wood & shell fragments	20
		v.f.s	olive gray	wood fragments (max. 10mm)	22
25		v.f-f.s	grayish olive	wood & shell fragments with mica	25
30		v.f.s	gray	wood & shell fragments with mica	31
35		v.f.s	gray	mica 33-34 m wood fragments (max. 10mm)	35
		silty v.f.s	olive gray	mica	36
		peat	brownish □black	mica	37
		peaty v.f.s	olive black	mica	39
40					
45		v.f.s	gray	mica	
50					56

Figure 4.1.4 (1)

No. 2

Geological Log Sheet *(JICA Study Team) by cutting samples*

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana Keshabpur
Union Keshabpur
Mouza Brahmakati
Location

Drilling No. Js-OW-1
Depth 50 m ~ 100 m

Recorder K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
50					
		v.f.s	gray	mica	56
55					
		v.f-f.s	gray	mica 61-62 m nodule (1x3 mm) 62-63 m wood fragments 64-65 m nodule (2x4 mm)	66
60					
65					
		f-m.s	gray	mica	71
70					
		m.s	gray	mica	73
		m-c.s	gray	mica	78
75					
		f.s	gray	mica	79
80		m.s	gray	mica 80-81 m gravel 81-82 m reddish mineral (garnet?)	82
		m.c.s	gray	mica	83
		v.f.-f.s	gray	mica	84
85		f.s	gray	mica	87
		m.-f.s	gray	mica	89
90		m.s	gray	mica & reddish mineral (garnet?)	90
		f.-m.s	gray	mica	92
95		m.s	gray	mica	98
		m.-c.s	gray	gravel with mica	100
100					

Figure 4.1.4 (2)

No. 3

Geological Log Sheet *(JICA Study Team) by cutting samples*

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana Keshabpur
Union Keshabpur
Mouza Brahmakati
Location

Drilling No. Js-OW-1
Depth 100 m ~ 150 m
Recorder K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
100					
		f.s	gray	mica	101
		f.-m.s	gray	shell fragments with mica	
105				104-105 m gravel	105
		f.s	gray	mica	106
		f.-m.s	gray	mica	
				108-109 m silt block	109
110		f.-m.s	gray	gravel with mica	
115				111-117 m shell fragments	117
		f.s	gray	shell fragments with mica	
120				121-122 m silt block (4 mm)	123
		f.-m.s	gray	shell fragments (numerous)	124
125		v.f-f.s	gray	shell fragments (numerous)	
				126-127 m silt block (4 mm)	
130					
135				130-137 m silt block (4 mm)	137
140		v.f.s	gray	shell fragments with mica	142
		f.s	gray	shell & wood fragments	
145				144-145 m silt block	145
		v.f.s	gray	shell fragments	146
		f.s	gray	shell & wood fragments	148
150		v.f.s	gray	shell & wood fragments 149-150 m silt block	150

Figure 4.1.4 (3)

No. 4

Geological Log Sheet *(JICA Study Team) by cutting samples*

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana Keshabpur
Union Keshabpur
Mouza Brahmakati
Location

Drilling No. Js-OW-1
Depth 150 m ~ 200 m
Recorder K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
150					
		f.s	gray	shell & wood fragments with silt block	151
		silty v.f.s	olive gray	shell & wood fragments with mica 153-154 m wood fragment (2 cm)	159
160		v.f.-f.s	olive gray	shell fragments with mica	160
		f.-m.s	gray	shell fragments with mica	161
		v.f-f.s	olive gray	shell fragments with mica	162
		v.f.s	olive gray	shell & wood fragments with mica	163
165		silt	olive gray	shell fragments	165
		f.s	olive gray		166
170		silt	olive gray		172
		clayey silt	grayish olive		174
175		v.f.-f.s	olive gray	mica	175
		clayey silt	grayish olive		176
		silty v.f.s	olive gray		177
		v.f.-f.s	olive gray	shell fragments	178
180		v.f.s	gray	mica 182-183 m wood fragments (1 mm)	186
185					
190		v.f.-f.s	olive gray	mica 189-190 m silt block 191-192 m silt block	192
		v.f.s	olive gray		193
195		silty v.f.s	olive gray		197
200		sandy silt	olive gray		203

Figure 4.1.4 (4)

No. 5

Geological Log Sheet *(JICA Study Team) by cutting samples*

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana	Keshabpur	Drilling No.	Js-OW-1
Union	Keshabpur	Depth	200 m ~ 250 m
Mouza	Brahmakati		
Location		Recorder	K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
200					
		sandy silt	olive gray		203
205		v.f.-f.s	olive gray	mica	207
210		f.s	gray	shell fragments with mica	
215					217
		v.f.-f.s	olive gray	217-218 m silt block mica	222
220					
225		silty v.f.s	olive gray	mica	227
		sandy silt	olive gray	227-228 m wood fragments (2.5-8.0 mm) 232-233 m shell fragments	237
230					
235					
240		silty v.f.-f.s	olive gray		243
245		v.f.-f.s	olive gray	shell fragments with mica	246
250		v.f.-f.s	olive gray		251

Figure 4.1.4 (5)

No. 6

Geological Log Sheet *(JICA Study Team) by cutting samples*

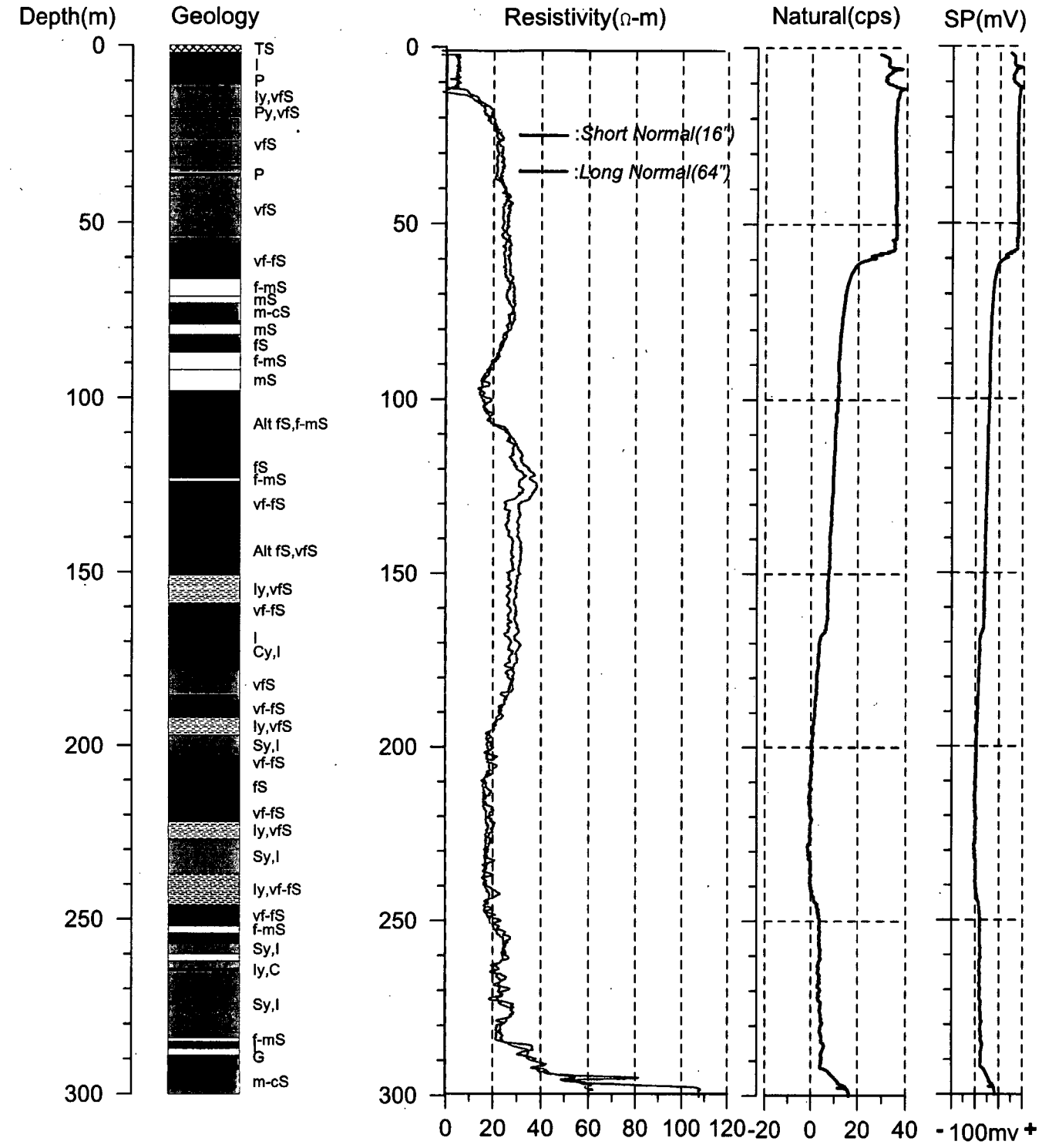
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS
FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

Thana Keshabpur
Union Keshabpur
Mouza Brahmakati
Location

Drilling No. Js-OW-1
Depth 250 m ~ 300 m
Recorder K. Suenaga

Depth (m)	Lithological Symbol	Facies	Color	Description	Bottom of layer (m)
250					
		v.f.-f.s	olive gray		251
		f.s	olive gray		252
		f.-m.s	olive gray	mica 253-354 m silt block	254
255		f.s	olive gray	shell fragments 255-257 msilt block	257
		sandy silt	olive gray		260
260		f.-m.s	olive gray	shell fragments with mica	264
		sandy silt	olive gray		264
265		silty clay	olive gray		265
		v.f.s	olive gray	mica	266
		sandy silt	olive gray		271
270		f.s	olive gray	shell fragments & silt block with mica	272
275		sandy silt	olive gray		284
280					
285		f.-m.s	gray	shell fragments & silt block	285
		v.f.-f.s	olive gray	silt block	286
		silt	grayish olive		287
		m.s	olive gray	gravel (quartzite) 288-289 m silt block	289
290		gravel		matrix c.-v.c.s (quartzite)	290
		c.s	olive gray	gravel & shell fragments	292
		f.s	gray	gravel with mica	293
295		m.-c.s	gray	gravel & shell fragments with mica	
300					300

Figure 4.1.4 (6)



C: Clay
I: Silt
S: Sand
G: Gravel
v: very
f: fine
m: medium
c: coarse

Cy: Clayey
Iy: Silty
Sy: Sandy
w: with
-: to
Alt: Alternation
P: Peat
TS: Top Soil

Figure 4.1.5 — **Columnar Section and Geophysical Logging at JS-OW-1 Site [Brahmakati, Keshabpur]**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

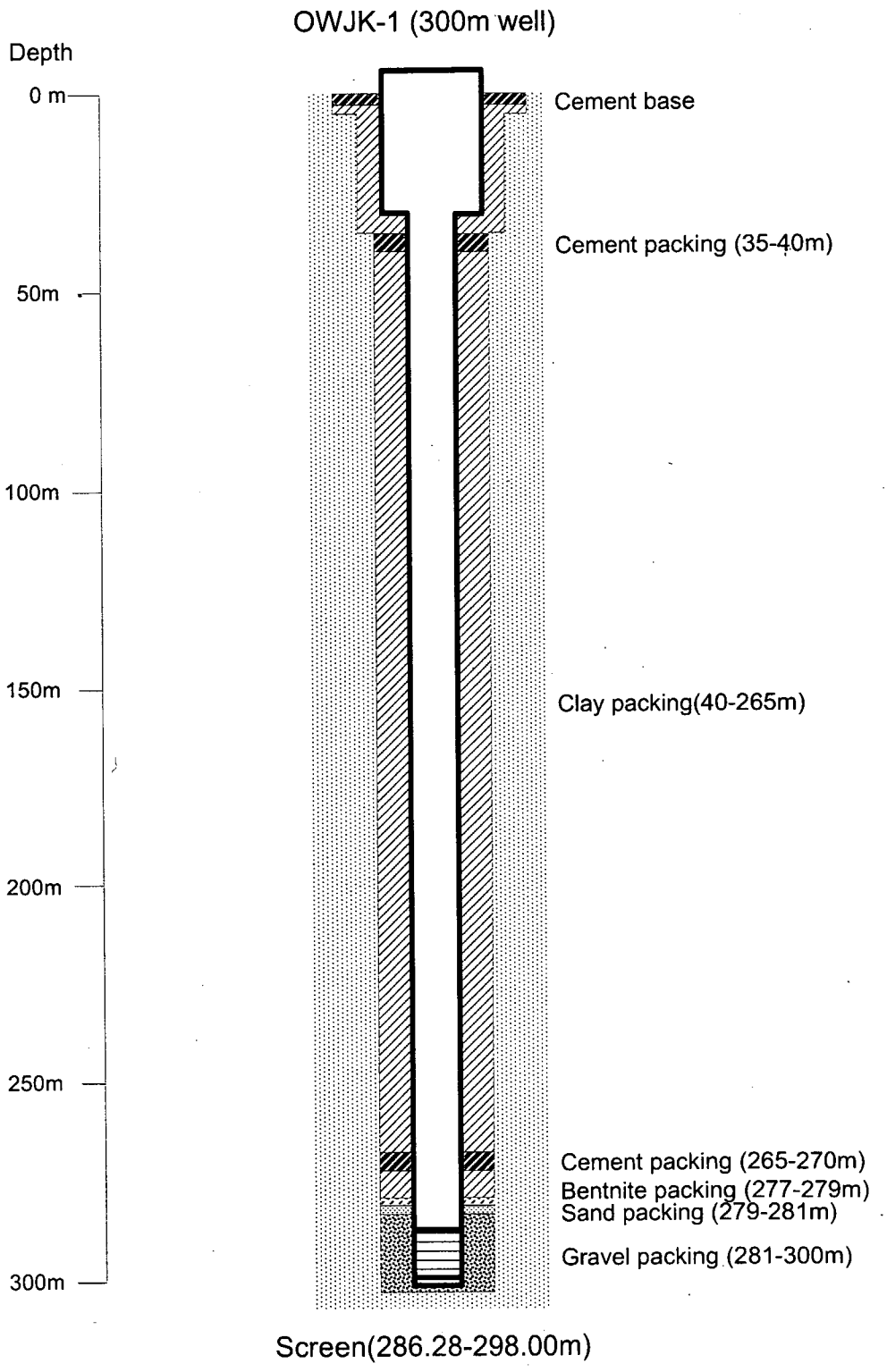


Figure 4.1.6	Casing Program (Brahmakati)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

4.2 Pumping Test

4.2.1 Method of Pumping Test

The pumping test can provide very important data to evaluate aquifer characteristics such transmissivity, storage coefficient, leakage, and so on. It is also used to evaluate well efficiency by performing a step-drawdown test. In addition, the pumping test can provide important information on water quality by measuring water quality during test.

In the pumping test, only a production well was used, but observation wells didn't exist.

The following three kinds of tests were carried out:

① Step-drawdown test (20 hours in total, 10 steps (up 5 steps, down 5 steps)

② Continuous pumping test (48 hours)

③ Recovery test (12 hours)

①The step-drawdown test can afford a specific capacity at each step, and well loss and aquifer loss can also be calculated. The step-drawdown test was conducted prior to the continuous pumping test. A suitable pumping rate for the continuous pumping test was gained. Ten (10) steps with pumping duration of two (2) hours for each step were conducted in each step-drawdown test. In the first five (5) steps, the pumping rate increased step-wise. The total pumping time was 20 hours.

During the step-drawdown test, groundwater samples for measuring arsenic levels were collected. The following parameters were also measured at the time of each sampling in the field:

Water temperature, pH, ORP, EC

As (by Field Kit), Fe (by Pack Test Kit)

②The continuous pumping test can afford transmissivity and storage coefficient by the Theis method and Cooper-Jacob method. Hydraulic conductivity values can be estimated in consideration of aquifer thickness based on the transmissivity values. After the declined groundwater level by the step-drawdown test was fully recovered, the continuous pumping test was carried out. The duration of pumping was 48 hours. The pumping rate was decided based on the result of the step-drawdown test. The changes in groundwater levels were measured at the pumped well

During the continuous pumping test, groundwater samples for measuring arsenic levels were collected. The following parameters were also measured at the time of each sampling in the field:

Water temperature, pH, ORP, EC

As (by Field Kit), Fe (by Pack Test Kit)

③The recovery test can provide transmissivity values by recovery method of analysis. The

recovery test was started just after the continuous pumping test. The recovery of the groundwater level was measured as the residual drawdown. The duration of the recovery test was 12 hours.

Before the pumping test, the borehole was washed out for taking the bentonitic mud by air-lift pump. Before the real pumping test, a pre-pumping test was carried out to obtain the maximum rate of step-drawdown test.

4.2.2 Results

1) Pumping test

The pumping test at the drilling site started from 9th March 2002. First of all, the pre-pumping test was carried out and the step-drawdown test was performed on the 10th of March, 2002. The continuous test was carried out from the 10th to the 12th of March. The finishing time of the Recovery test was 8 AM on March 13.

(1) Step-drawdown test

The results of the step-drawdown test at the observation deep well are summarized in Table 4.2.1. The specific capacity value of each step was obtained from the test, and then the aquifer loss coefficient (*B*) and well loss coefficient (*C*) was computed. The well efficiency of each observation well was also calculated. Figure 4.2.1 shows the results of the step-drawdown test in Brahmakati. The maximum pumping rate for the step-drawdown test was 88.5m^3/day. The static water level and dynamic water level are 6.51 and 15.838m. Consequently, the drawdown at maximum pumping rate was 9.328m. The specific capacity was calculated as 9.48m^2/day at maximum pumping rate. The values of specific capacity (*Sc*) range from 9.48 to 15.42m^2/day. The aquifer loss coefficient (*B*) and well loss coefficient (*C*) are calculated as 5.56E-02day/m^2 and 4.76E-04day^2/m^5, respectively. The average well efficiency is computed as 62.66%. The Discharge-Drawdown graph (*Q* - *s* curve) shows that the curve during decreasing *Q* isn't so similar to that of increasing *Q*.

Table 4.2.1 Results of Step-Drawdown Test in Brahmakati

District	Upazila/ Pourashava	Site Name (Site No.)	Well/Hole Type	Well/Obs. Hole No.	Drilling Depth (m)	Well Depth (m)	Screen Depth(s) (m)	Screen Length (m)
Jessore	Keshabpur	Brahmakati	Obs. Well (Production Well)	Js-OW-1	300	299	286.28-298	11.7

Date (dd/mm/yy)	Static Water Level (m)	Step-1	Step-2	Step-3	Step-4	Step-5	Step-6	Step-7	Step-8	Step-9	Step-10
		$Q_1(m^3/d)$	$Q_2(m^3/d)$	$Q_3(m^3/d)$	$Q_4(m^3/d)$	$Q_5(m^3/d)$	$Q_6(m^3/d)$	$Q_7(m^3/d)$	$Q_8(m^3/d)$	$Q_9(m^3/d)$	$Q_{10}(m^3/d)$
		$s_1(m)$	$s_2(m)$	$s_3(m)$	$s_4(m)$	$s_5(m)$	$s_6(m)$	$s_7(m)$	$s_8(m)$	$s_9(m)$	$s_{10}(m)$
		$Sc_1(m^2/d)$	$Sc_2(m^2/d)$	$Sc_3(m^2/d)$	$Sc_4(m^2/d)$	$Sc_5(m^2/d)$	$Sc_6(m^2/d)$	$Sc_7(m^2/d)$	$Sc_8(m^2/d)$	$Sc_9(m^2/d)$	$Sc_{10}(m^2/d)$
		$Ew_1(\%)$	$Ew_2(\%)$	$Ew_3(\%)$	$Ew_4(\%)$	$Ew_5(\%)$	$Ew_6(\%)$	$Ew_7(\%)$	$Ew_8(\%)$	$Ew_9(\%)$	$Ew_{10}(\%)$
09/03/02	6.510	16.4	34.6	49.7	72.6	88.5	71.2	52.6	36.7	34.2	18.9
		1.060	2.430	4.170	5.670	9.330	7.550	5.950	4.080	3.170	1.750
		15.4	14.2	11.9	12.8	9.5	9.4	8.8	9.0	10.8	10.8
		85.76	79.08	66.28	71.17	52.75	52.40	49.14	49.94	60.04	60.05

Aquifer Loss Coefficient B (d/m^2)	Well Loss Coefficient C (d^2/m^5)	Average Well Efficiency (%)
5.56E-02	4.76E-04	62.66

(2) Continuous Pumping Test

The results of the continuous pumping test at the observation deep well are summarized in Table 4.2.2. The values of transmissivity (*T*) and the storage coefficient (*S*) were obtained by the Cooper-Jacob method (Cooper and Jacob, 1946). For the analysis, two (2) kinds of drawdown data were used; one was the drawdown in the pumped well and the other was the drawdown in the deepest observation hole, which tapped the same aquifer from which the pumped well extracted the groundwater. Figure 4.2.2 shows the results of the continuous pumping test at Js-OW-1 well. The test was carried out with a constant discharge rate of 4.0m^3/day (slightly more than the discharge of the step-drawdown test). The drawdown ranged from 0.715 to 18.81m. The maximum drawdown was 18.81m. From the fitted line, the values of *T* and *S* are computed as 2.450 m^2/day and 5.87E-0, respectively.

(3) Results of Recovery Test

The results of the recovery test at the observation deep wells are also summarized in Table 4.2.2. The value of transmissivity (*T*) was obtained by the recovery method using the residual drawdown curve on the semi-log plot. For the analysis, two (2) kinds of residual drawdown data were used; one was the residual drawdown in the pumped well and the other was the residual drawdown in the deepest observation hole, which tapped the same aquifer from which the pumped well extracted the groundwater. Figure 4.2.2 shows the results of the recovery test at Js-OW-1 well. The test was carried out just after the 2,880 minutes of the continuous pumping test with a constant discharge rate of 4.0m^3/day. In the pumped well, the groundwater level was quickly recovered and the straight portion of the residual drawdown curve appeared at time

ratios from 5 to 50. From the fitted line, the value of transmissivity (*T*) can be computed as 5.944m^2/day.

Table 4.2.2 Resuls of Continuous Pumping Test in Brahmakati

District	Upazila/ Pourashav	Site Name (Site No.)	Well/Hole Type	Well/Obs. Hole No.	Drilling Depth (m)	Well Depth (m)	Screen Depth(s) (m)	Screen Length (m)
Jessore	Keshabpur	Brahmakati	Obs. Well (Production Well)	Js-OW-1	300	299	286.28-298.0	11.72

Continuous Pumping Test						Results of Analyses					
Date	Static Water Level	Pumping Rate, Q	Pumping Duration	Final Drawdown,	Specific Capacity, S	Data Used*	Cooper-Jacob Method			Recovery Method	
							T	k_{ap}	S	T	k_{ap}
(dd/mm/yy)	(m)	(m^3/day)	(hours)	(m)	(m^2/day)		(m^2/day)	(m/day)		(m^2/day)	(m/day)
10/03/02	6.385	93.8	48	18.810	5.0	P	2.45	0.2	5.87E-01	5.944	0.5

* P: Pumped Well/Hole Data

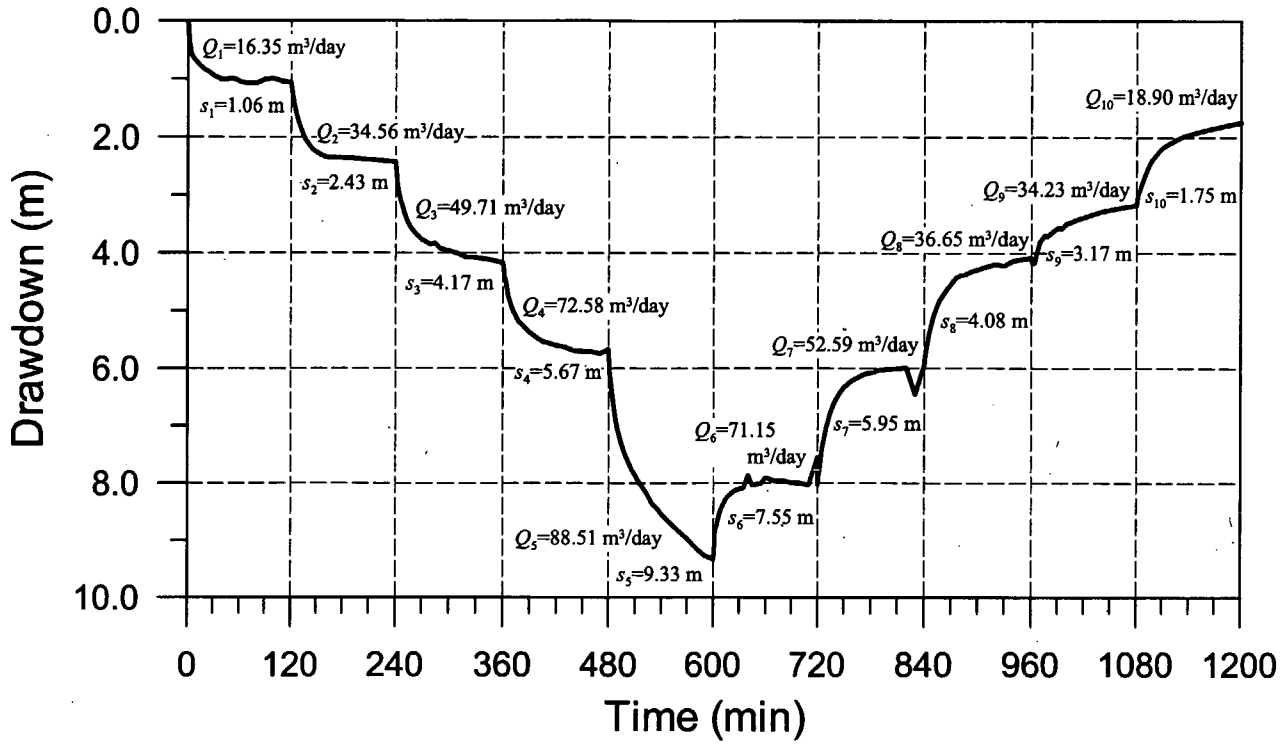
2) Arsenic Concentrations during Pumping Test

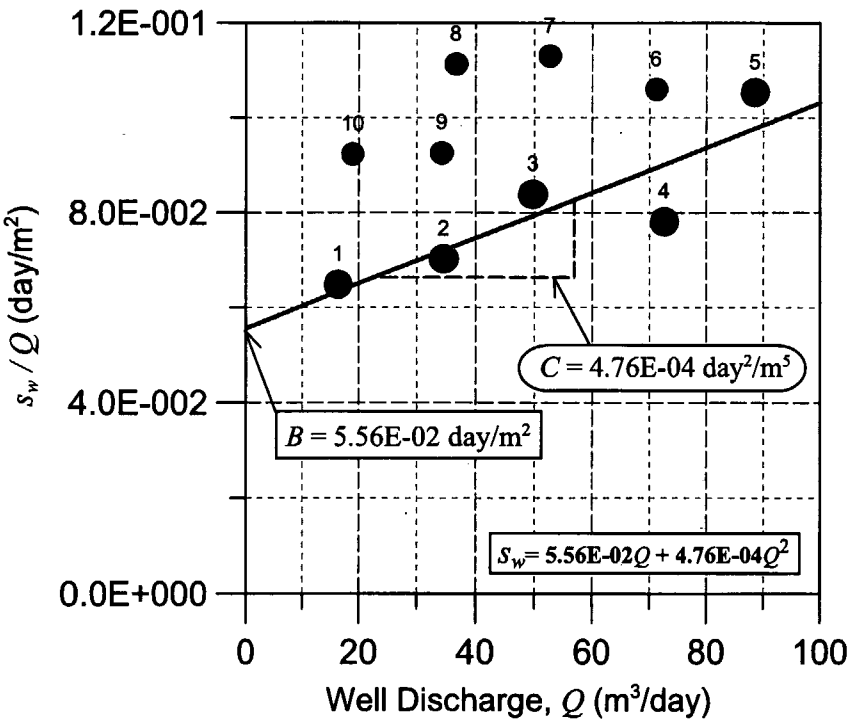
(1) Step-Drawdown Test

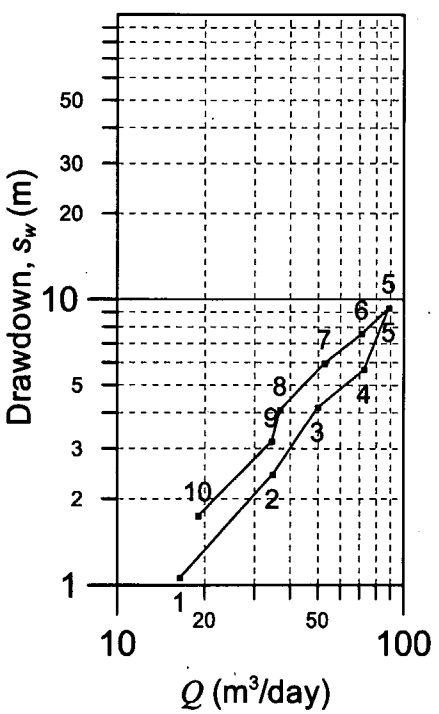
The arsenic concentration was from 0.00 to 0.01mg/l from 5 to 500 minutes until 5th step by FK. The values of arsenic concentration level by AAS varied from 0.0034 to 0.0075g/l. The Eh values ranged from 105 to 161mV. The pH values indicated high values from the beginning. After 20 minutes in the 1st step from the beginning it was at 8.04. Then the values varied within a range from 7.80 to 8.15. EC values show some irregular fluctuations. Then the values varied within a range from 68.3 to 69.9mS/m (see data sheets).

(2) Continuous Pumping Test

The arsenic concentrations fluctuated with a range from 0.00 to 0.01mg/l from the beginning to 2,340 minutes by FK, then in a short time it increased to 0.02mg/l. Finally the arsenic concentration showed 0.01mg/l by FK. The values of arsenic concentration level by AAS varied from 0.0035 to 0.0056mg/l. Finally, the arsenic concentration had the stable values of 0.0046 to 0.0052mg/l. The Eh values fluctuated greatly from 18 to 111mV. From180 to 1,620 minutes, Eh values ranged from 18 to 72mV. After 2,880 minutes, The Eh value was 98mV. The pH values ranged from 7.71 to 8.08 in pH. The EC values indicated from 67.9 to 72.6mS/m. After that Eh, pH and EC stabilized until the end of the pumping test (see data sheets).





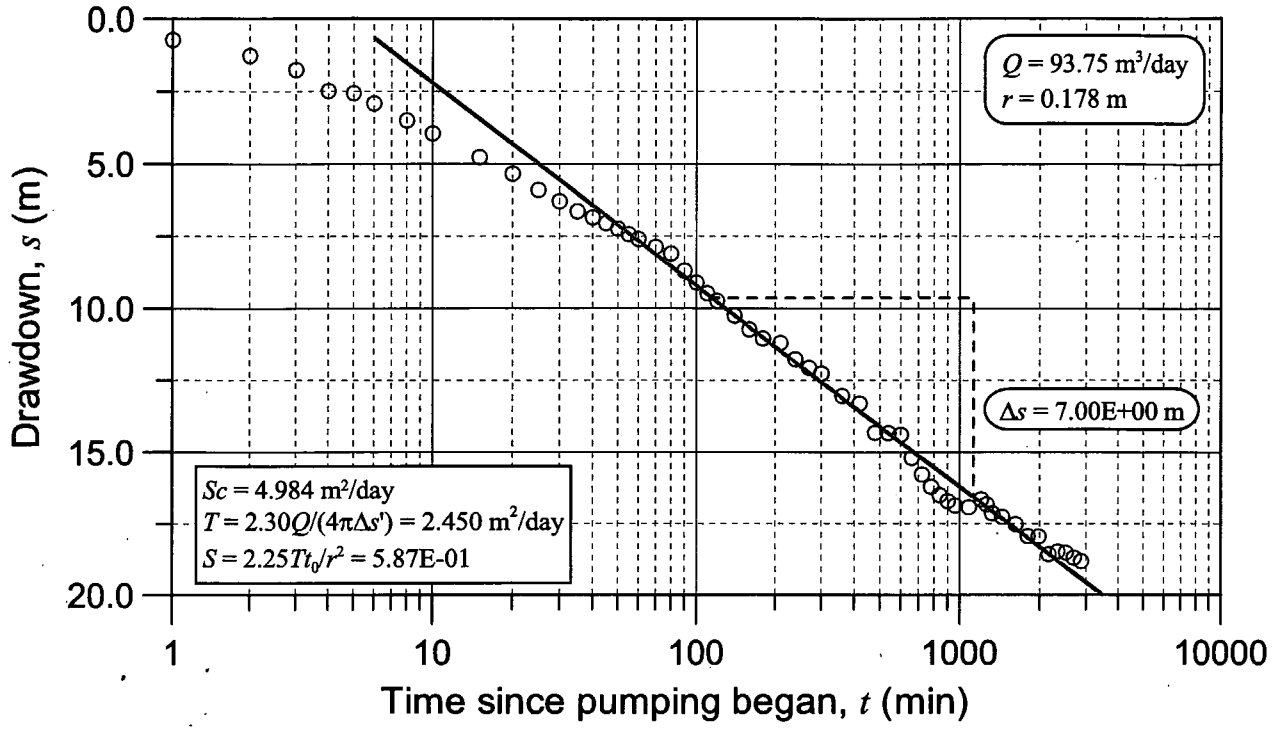


Location:	Brahmakati, Keshabpur, Jessore
Site No.:	KSB-1
Well No.:	Ksb-1
Well Depth:	299.0 m
Well Diameter:	355.60 mm
Screen Depths:	286.28-298.0 m
Screen Length:	11.72 m
SWL:	GL- 6.510 m on 10-03-2002

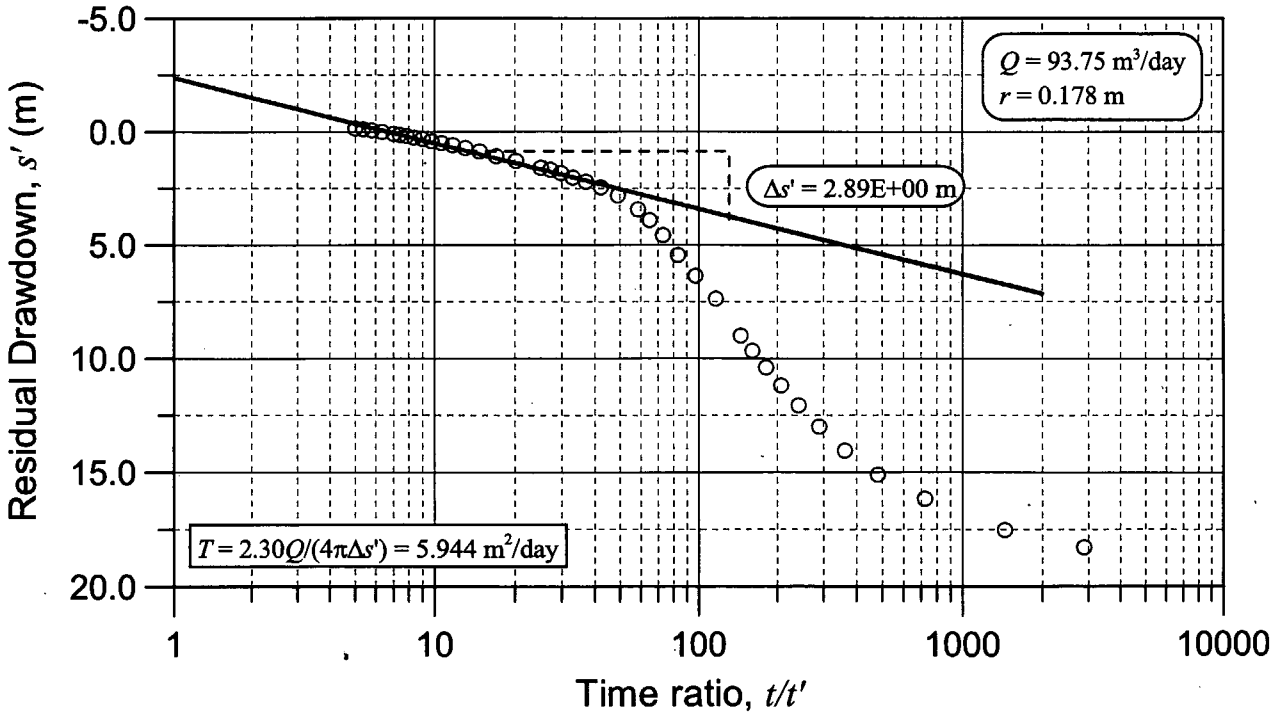
Figure 4.2.1 **Results of Step-Drawdown Test at Js-OW-1 Observation Well**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



(a) Continuous Pumping Test at Js-OW-1 Well



(b) Recovery Test at Js-OW-1 Well

Location:	Brahmakati, Keshabpur, Jessore
Site No.:	KSB-1
Well No.:	Ksb-1
Well Depth:	299.0 m
Well Diameter:	355.60 mm
Screen Depths:	286.28-298.0 m
Screen Length:	11.72 m
SWL:	GL- 6.385 m on 10-03-2002

Figure 4.2.2 — **Results of Continuous Pumping Test and Recovery Test at Js-OW-1 Well**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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4.3 Hydrogeological Structure in Keshabpur area

As stated above, Figure 4.3.1 shows the location map of geological profiles and Figures 4.3.2 and 4.3.4 show the geological profiles in the direction of north to south. The interpretations of hydrogeological structure can be outlined based on the hydrogiological profiles.

4.3.1 A-B-C Profiles

A-B-C profile ranges north (direction of Jessore) to south (direction of Tala thana). Figures 4.3.2 and 4.3.3 show the aquifers of three horizons. The depths of each horizon for the aquifers are from about 50 to 100m, and 220 and 300m in depth except for the coarse sand lenses at about 150m in depth. **Upper aquifer** is distributed from about 50 to 100m in depth continuously. This layer consists of medium to coarse sand, medium sand and fine to medium sand. The upper aquifer is about 50m thick. However the thickness of this layer varies about less than 50m thick at the south of kesabpur mouza and also is divided into two layers. According to the results of screening survey, almost all wells have taken groundwater from this horizon, which is contaminated by arsenic. **Middle aquifer** is seen at about 220m in depth, however this layer is not continuous and is recognized at the north of kesabpur mouza and several parts of Tala thana. This layer is composed of coarse and fine to medium sand. The thickness of middle aquifer is probably less than 30m. According to the information of Tala thana DPHE office or the results of the improved wells data in R. Bankabarsi mouza, groundwater that is taken from this horizon has not been contaminated by arsenic. **Lower aquifer** is distributed at a depth of nearly 300m in the surroundings of this drilling site. It is not confirmed whether this layer is widely distributed or not. However Figure 4.3.2 shows the possibility of the continuous distribution of this aquifer, as the depth of this layer in the south is probably gradually deeper than that of the well drilling site. The thickness of the lower aquifer is more than 10m. This layer consists of medium to coarse sand with fine gravels.

4.3.2 D-E Profiles

D-E profile ranges north (in the direction of Jessore) to south (in the direction of Dumuria thana). Figure 4.3.4 shows the aquifers of two horizons. The depths of two horizons for the aquifers are from about 20 to 70m and from about 150 to 250m in depth. Both the upper aquifer and the lower aquifer are continuous from north to south. **Upper aquifer** is distributed from about 20 to 70m in depth. The upper aquifer is about 50m thick. This layer mostly consists of fine sand. This aquifer corresponds to the upper aquifer of A-B-C profiles and groundwater of this aquifer is contaminated by arsenic. **Lower aquifer** is underlying from about 150 to 250m in depth. Both the thickness and depth in the southern part of this aquifer are thinner and deeper than the northern part of the aquifer. The lower aquifer is about 30 to 100m thick and ranges

about 70m in the direction of south. Furthermore, according to the results of core boring in R. Bankabarsi mouza, this aquifer is about 20m thick. This aquifer corresponds to the meddle aquifer of A-B-C profiles. The groundwater of this aquifer is not contaminated by arsenic.

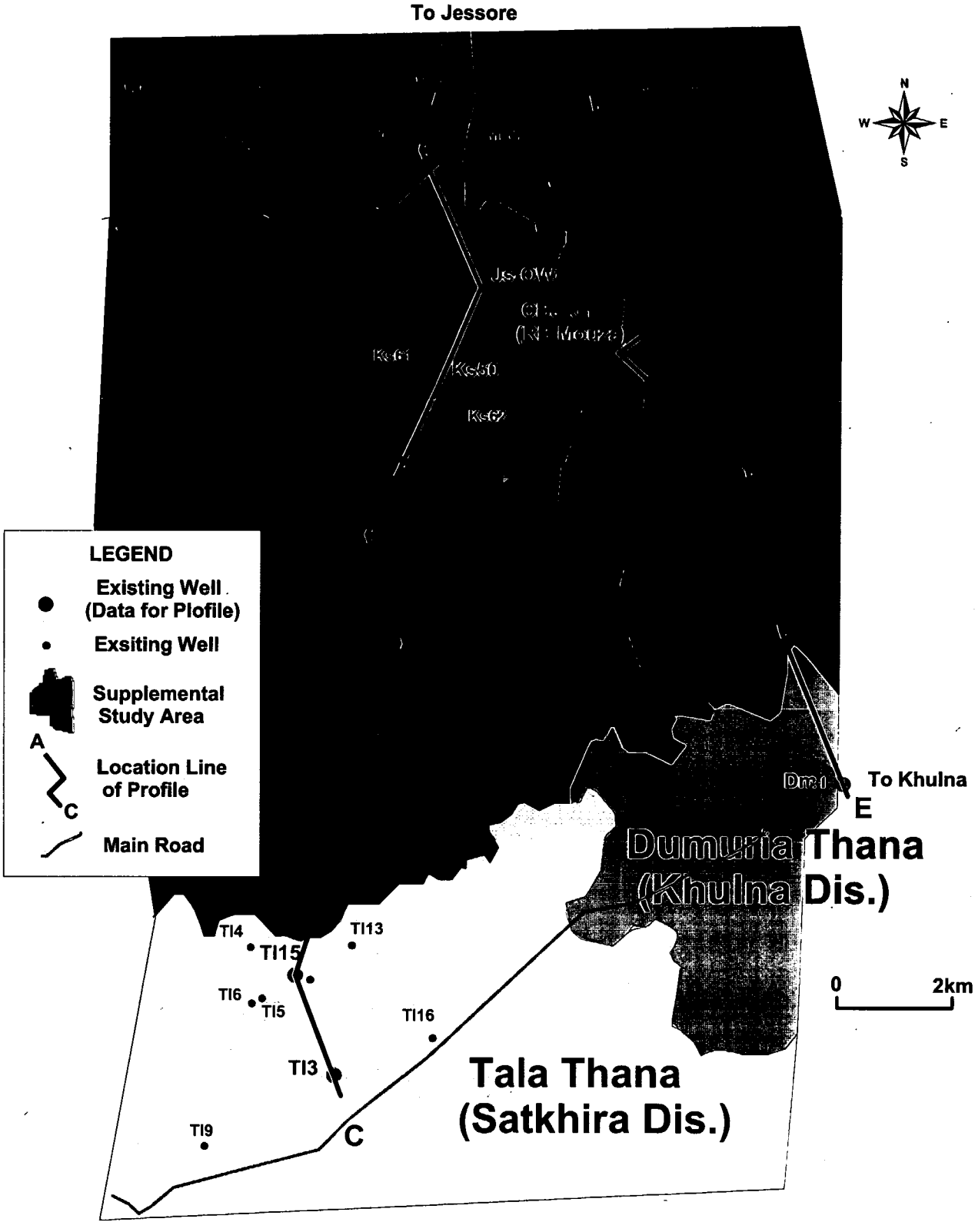

Figure 4.3.1	Location Map of Geological Profile
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

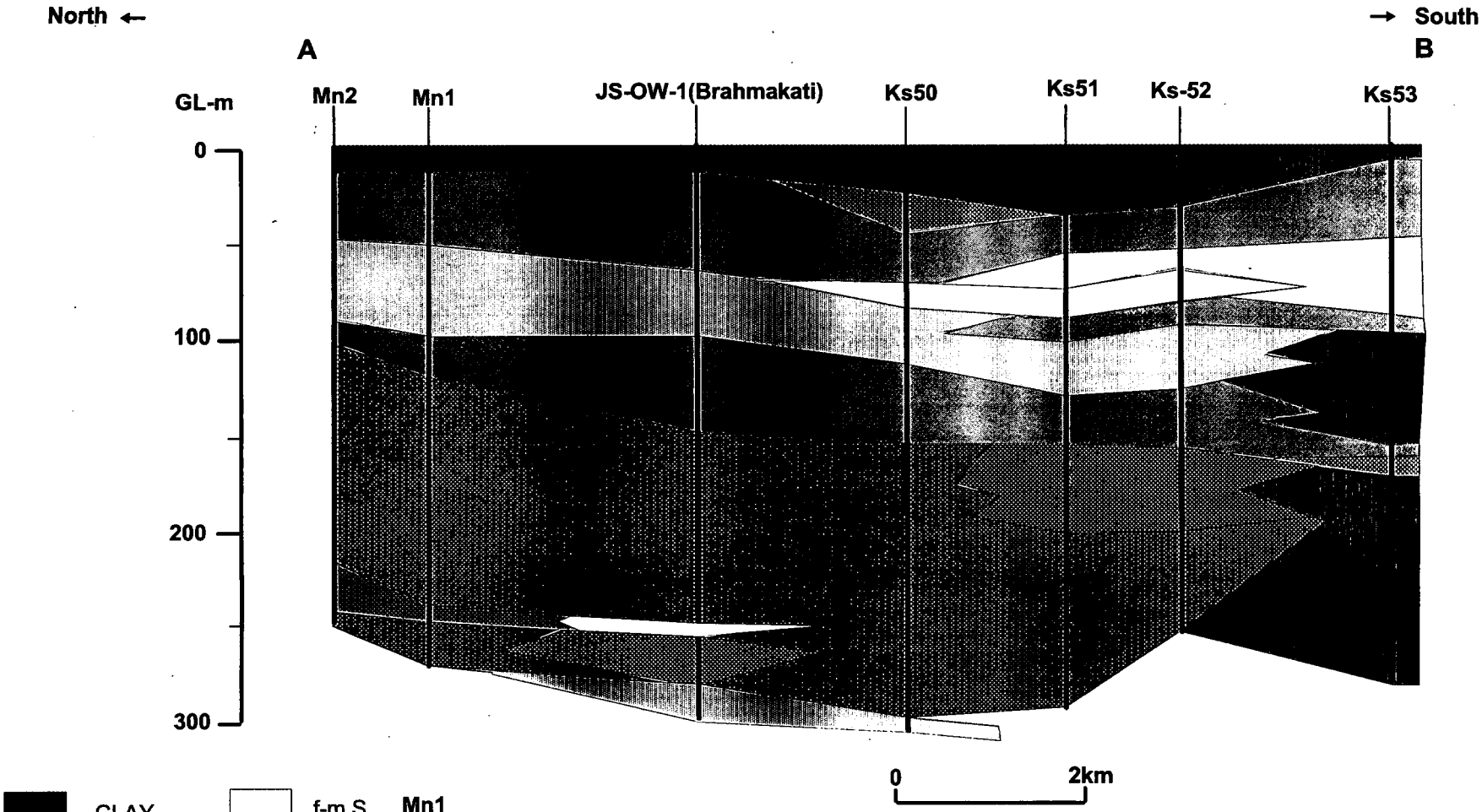

Figure 4.3.2 **Geological Profile (A-B)**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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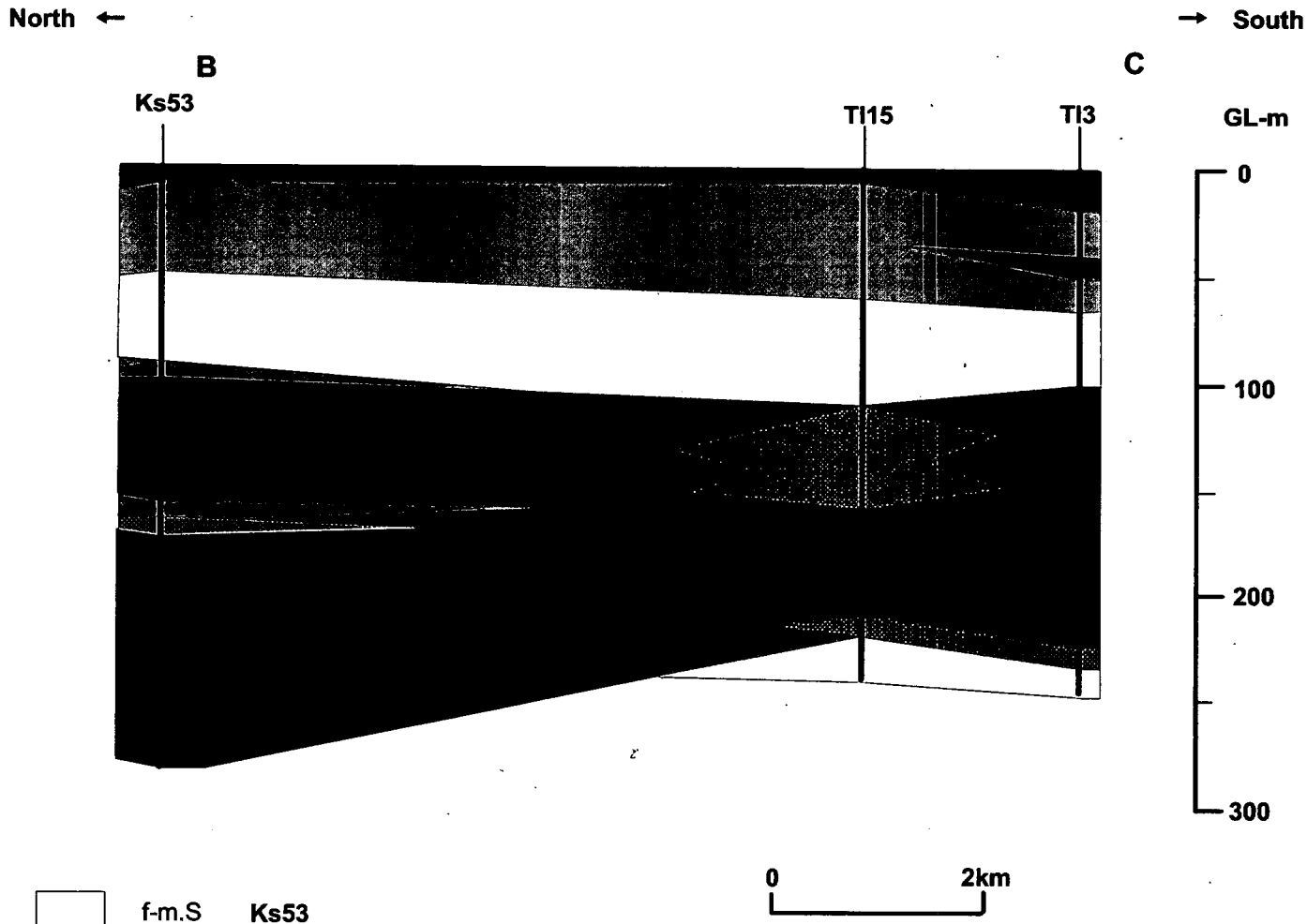

Figure 4.3.3 **Geological Profile (B-C)**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

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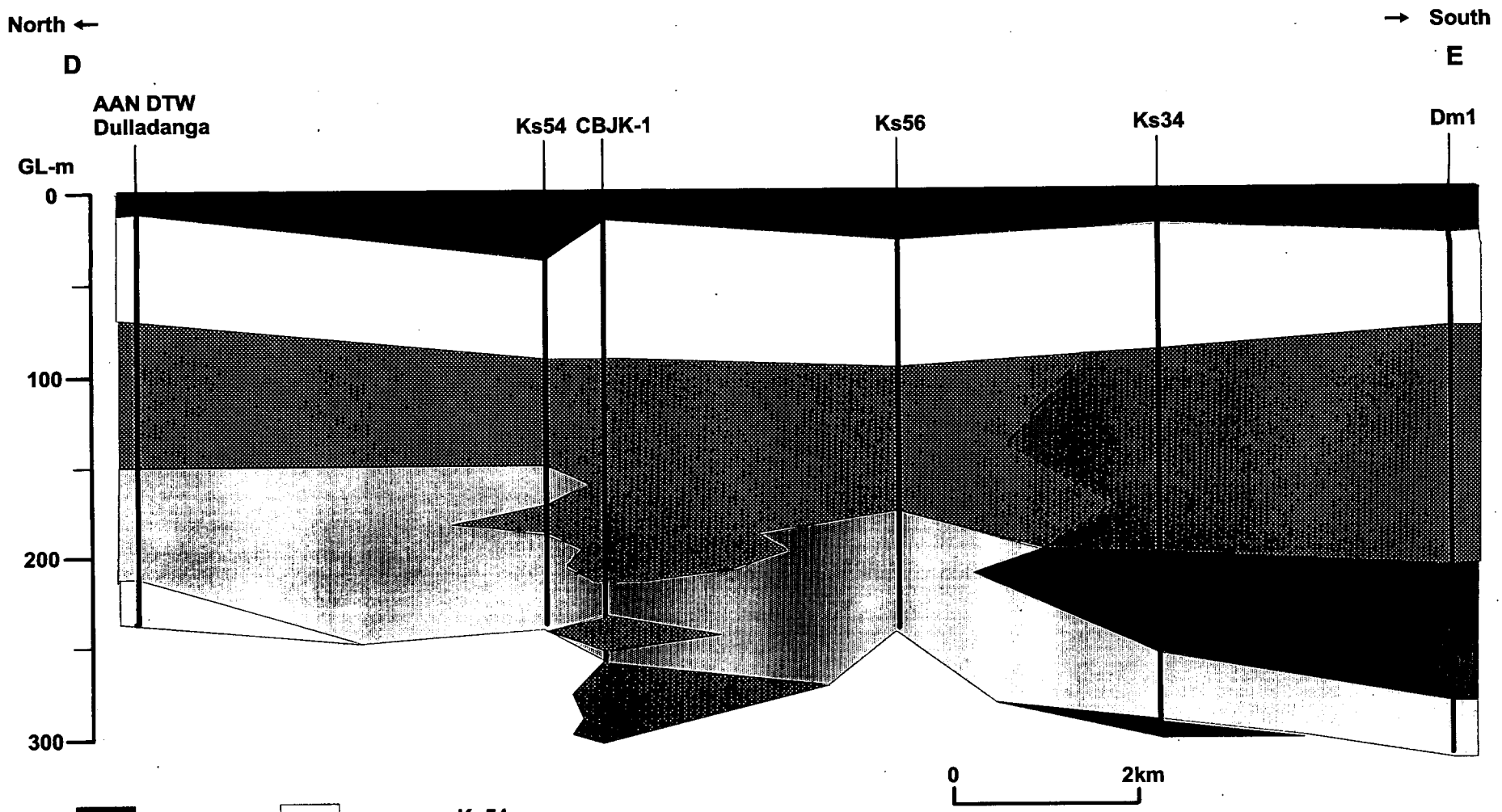


Figure 4.3.4 **Geological Profile (D-E)**

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CHAPTER 5

STUDY ON SOCIO-ECONOMIC CONDITION IN TARGET AREA

Supporting Report 2

CHAPTER 5 STUDY ON SOCIO-ECONOMIC CONDITIONS IN TARGET AREA

5.1 Objective of Study

The purpose of this study is to understand the socio-economic conditions in the target area including 16 Mouzas and to examine the sustainability of improved water supply systems in its region from a socio-economic point of view. To get a picture of the general features of the area, information on the demographic characteristics of Mouzas, community activities, economic activities, physical infrastructure, health facilities and school facilities was collected. Likewise, information on household demography, household economy, water use and awareness about arsenic problems was gathered to recognize the general features of households in the area.

5.2 Methodology of Study

5.2.1 Period, Approach and Sampling Frame

The fieldwork for the study was undertaken in January and February 2002 in 16 Mouzas. To meet the study objective of understanding the general features of Mouzas and households, the research method utilized was the interview approach using questionnaire forms shown in Annexes 5.1 and 5.2. The sampling frame consisted of 16 community leaders and 112 households (for interviewed households' locations, see Figure 5.1). All community leaders completed the Community Questionnaire in Annex 5.1 and all households did the Households Questionnaire in Annex 5.2.

5.2.2 Sample Size

The sample size of the household survey was determined based on the expected number of total households in the 16 Mouzas and villagers' knowledge about arsenic poisoning. According to Population Census 1991, the population of the 16 Mouzas was 26,117; the annual growth rate of the population during 1981 to 1991 was 2.17%; and the average household size in 1991 (National) was 5.48. Based on these data, the expected number of households in the 16 Mouzas in 2002 was 6,035. Taking 6,035 as the population (N), the sample size was calculated as 95 using the formula[1] assuming that half of all villagers have knowledge about arsenic poisoning (P=0.5). As previously mentioned, the actual number of households sampled was 112, which was large enough to satisfy the required sample size of 95.

[1] $n \geqq N/((e/k)^2(N-1)/P(1-P)+1) = 95$, where N = 6035, e = 0.1, k = 1.96, P = 0.5

5.2.3 Informants Identification

Community leaders were identified from a series of hearings from villagers. Schoolteachers often provided precious information on leaders or persons who were the most familiar with the community. If there was a Union Parishad member or a councilor in a village, in most cases, he/she was named as a community leader by villagers.

In the household-survey part, seven households were sampled at each Mouza. To ensure that the essential rule of sampling was obeyed (i.e. that every household had a chance of inclusion in the sample) it was necessary to sample households randomly using a list of all households in the Mouzas. However, since such a list was not available, the actual sampling was conducted in the following manner. First the seven largest groups of households or Paras were identified in respect of their population. Then from each Para one household was randomly selected. The household to be sampled was determined by its location: one counted as the fifth household north from the first household located at the southern end of its Para's border. If there were less than seven Paras, for example six, two households were selected from the largest Para. In this manner, household representation was secured though there were some groups of people who were excluded from the sample, such as those who lived in Paras with low populations.

5.2.4 Interviewers and Interview Process

The interviews were conducted by three Bangladeshi: two interviewers and one supervisor. Since female informants were expected in the household survey, a female interviewer was recruited. All of three members were trained by the JICA Study Team in a two-day training session on how to ask questions and record responses in a proper manner. During the training session, the questionnaires were pre-tested in Rajinagar Bankabarsi, one of 16 Mouzas. Through this pre-test, the interviewers could clearly comprehend the contents of the questionnaires and how to explain the meanings of the questions to informants. The questionnaires were then revised, based on the pre-test and opinions from interviewers who conducted it. The interview process followed a protocol of introducing themselves, explaining the purpose of the visit and asking whether the respondents were willing to be interviewed.

5.2.5 Method of Analysis

Data gathered from 16 community leaders and 112 households were simply added up first. Then, the basic statistical values of the household data, such as median, were calculated. As for some variables, a statistical test was performed to see the degree to which the observed relationship of them is true in the sense of being representative of the population.

5.3 Findings of Study

5.3.1 General Features of Mouza

This section describes the general features of the 16 Mouzas in terms of demographic characteristics, community activities, economic activities and physical infrastructure. The following discussion is based on the data gathered from the 16 community leaders interviewed. For those who are interested in the socio-economic conditions of each Mouza in detail, please refer to Annex 5.3.

1) Demographic Characteristics of Mouzas

a. Area

The total area of the 16 Mouzas is 29.05684 km^2 (see Table 5.1). Altapol occupies the largest area of 5.27658 km^2 followed by Madhyakul, Bhagati Narendrapur, and Rajnagar Bankabarsi. Excluding these 4 Mouzas, the areas of the remaining 12 Mouzas are less than 2.0000km^2. Kesabpur occupies the smallest area of 0.41232km^2. The area of Altapol is about 13 times as large as that of Kesabpur. The average area of the 16 Mouzas is 1.81605km^2. With its relatively fair size of population, the population density is the highest in Kesabpur at 3,667 persons per km^2 (see Figure 5.2). Since the second highest population density is Altapol at 1,649 persons per km^2, one can understand how high Kesabpur's population density is. Kesabpur is regarded as an urban area in this region.

Table 5.1 Area of Mouza

Total	29.05684 km^2
Maximum	5.27658 km^2
Minimum	0.41232 km^2
Average	1.81605 km^2

b. Population

According to the Union Parishad office, the census 2001 shows that the total population of the 16 Mouzas is 34,684 (see Table 5.2)[2]. 12 Mouzas have populations of less than 2,000 (see Figure 5.3). Altapol has the single largest population of 8,702. The population is more than twice as large as Bhagati Narendrapur's 4,153. Sarfabad is the smallest Mouza in terms of the population. It has a population of 519. Altapol has about 17 times as large a population as Sarfabad does. The median is 1,410.5. It is the average of Sujapur whose population is 1,373 and Brahmakati, 1,448.

[2] The population of Rajnagar Bankabarsi is estimated based on the following assumption. The number of households is 412. The average household size is 4.71. The information about households is gathered from the school teachers in Rajnagar Bankabarsi. The household size is based on the study conducted in June and July 2000.

Table 5.2 Population of Mouzas

Total	34,684
Maximum	8,702
Minimum	519
Median	1,410.5

c. Households

The total number of households in the 16 Mouzas is 7,590 (see Table 5.3). All Mouzas have less than 1,000 households except Altapol (see Figure 5.4). The number of households in Altapol is much larger than the other 15 Mouzas. There are 1,932 households in Altapol, which account for 25.5% of the total households. In contrast, there are only 124 households in Sarfabad. Altapol has about 16 times as many households as Sarfabad does. The median of the number of households in the 16 Mouza is 304.

Table 5.3 Number of Households in Mouza

Total	7,590
Maximum	1,932
Minimum	124
Median	304

d. Cultural Background

Islam is the most worshiped religion in the Mouzas, followed by Hinduism and Christianity (see Table 5.4). There are 25,072 Muslims that account for 72.3% of the total population. 9,422, or 27.2% of the population villagers, are Hindus. Muslims are the majority in 11 out of the 16 Mouzas whereas Hindus are in 4 Mouzas. In Sujapur, the percentage of Muslims and Hindus is even. Christianity is worshiped but those who believe in it account for only 0.5% of the entire population.

Table 5.4 Religion

Islam	Hinduism	Christianity	Total
25,073	9,422	189	34,684 people
(72.3)	(27.2)	(0.5)	(100.0 %)

e. Literacy Rate

The literacy rate (15 years and over) varies by Mouza as well as by sex (see Table 5.5). If not even to, the literacy rate of male is higher than that of female. The literacy rate is less than 50% for females in 6 Mouzas. In Kesabpur, the literacy is over 80% for both sexes. In Sabdia, however, the literacy is less than 50% for males and less than 20% for females.

Table 5.5 Literacy Rate by Mouza

	<20	<50%	=50%	>50%	>80%	Total
Male	0	2	3	9	2	16 Mouza
Female	1	8	1	5	1	16 Mouza

2) Community Activities

a. Community Leader

Villagers select community leaders in several ways (see Table 5.6). Mostly leaders are selected through an election or discussion among villagers. In 7 Mouzas, leaders are elected by votes. In the Bangladeshi political system, there are 12 Union Parishad (UP) members or councilors elected. Since a UP member is familiar with his/her local community and its residents, he/she is often regarded as a community leader by villagers. In another 7 Mouzas, leaders are chosen through villagers' discussion. In Bhagati Narendrapur, elders appoint the leader. The leader of Habaspol inherits the position.

Table 5.6 Community Leader Selection

Elected by votes	Discussion	Appointed by elders	Inherited	Total
7	7	1	1	16 Mouza

b. Organized Meetings and Related Activities

There are organized community meetings held periodically in all 16 Mouzas. However, the frequency of holding such meetings is different depending upon the Mouza. We see from Table 5.7 that community meetings are held on a monthly basis in 8 Mouzas. There are a few Mouzas such as Baliadanga and Bajitpur where community meetings are held as frequently as daily or weekly.

Table 5.7 Organized Community Meetings

Daily	Weekly	Monthly	Quarterly	Semiannually	Total
1	1	8	4	2	16 Mouzas

In some Mouzas, community activities such as community sponsored health programs, community sponsored mutual assistance, construction and maintenance of infrastructure and cleaning the environment are conducted (see Table 5.8). All 16 Mouzas have sponsored health programs within the past five years. In 13 Mouzas, there have been community-sponsored programs to provide mutual assistance. Regarding the construction and maintenance of infrastructure, villagers take part in 11 Mouzas. In 8 Mouzas, there have been group efforts to clean up the environment during the same period mentioned above. We will discuss the villagers' participation in community activities later in 5.3.2-5).

Table 5.8 Community Activity Conducted by Mouza

Activity	Total 16 Mouzas
Health program	16
Mutual assistance	13
Construction and maintenance of infrastructure	11
Cleaning the environment	8

c. Action Taken by Mouzas against Arsenic Problem

There are several actions that have been taken by Mouzas against arsenic problems (see Table 5.9). Out of the 16 Mouzas, 13 have requested the government and/or NGOs to provide assistance, though there are no NGOs conducting activities related to arsenic poisoning in the 16 Mouzas. 12 Mouzas organize meetings of community residents to discuss arsenic problems. However, concrete and positive actions of villagers themselves, such as disseminating information or creating a committee to solve problems are not yet seen widely.

Table 5.9 Action Taken by Mouzas against Arsenic Problem

Action	Total 16 Mouzas
Ask GOV/NGO assistance	13
Organize meetings	12
Disseminate knowledge on symptoms/causes	7
Disseminate information on prevention method	6
Establish a committee	3
Invite a knowledgeable person	2

There are 7 patients suffering from arsenic poisoning recognized by community leaders. 5 patients are in Rajnagar Bankabarsi. In Brahmakati and Maguradanga, there is one person each acknowledged by the community leader as a patient.

The JICA Study Team conducted the medical examination for those who were suspected patients of arsenic poisoning on March 2, 2002 in Brahmakati, Bysdanga and Maguradanga. There were 13 patients who showed symptoms of arsenic poisoning (see Annex 5.3). In Bysdanga and Maguradanga, there were 5 patients each. The remaining 3 patients were in Brahmakati. All of the 13 patients were suffering from melanosis or dark spots on the skin. Three patients were so seriously affected that they lost their fingers or toes. Four patients showed other symptoms such as Keratosis or wart-like hardening of the skin. According to the medical doctor who examined the patients, they did not need any medical treatment except arsenic safe water. The doctor also mentioned that compared with Shamta, in Sharsha where the large percentage of the population suffered from arsenicosis, the number of arsenic patients in the 16 Mouzas seemed less. This might be related to the fact that, the doctor said, villagers used pond water for tcooking purposes. The socio-economic survey results showed that about 70% of the households in the 16 Mouzas use pond water for cooking. This may explain the reason why a fewer number of patients were observed. The 13 patients described above happened to be

found during the study by the JICA Study Team. There might be more patients suffering from arsenicosis in the 16 Mouzas.

3) Economic Activities

a. Industry

There are four major industries in the Mouzas as important sources of employment for individuals: farming, business, transportation and aquaculture (see Figure 5.5). Farming is the single most important source of employment in 14 Mouzas, followed by business. "Business" in villagers' word means a kind of brokerage. People buy cows for example and then they sell them. In 7 Mouzas, business is listed as the second most important employment source. Transportation or vehicle operation such as a rickshaw is an important source as well, following business. The forth industry listed is aquaculture.

Villagers leave their own Mouza temporarily during certain times of the year to look for work elsewhere. In 14 Mouzas, people move out to different places to look for a job while 11 Mouza accept those who move in. The type of work they look for is mainly in agriculture, forestry and/or fishery followed by sales/business.

b. Agriculture

There are various kinds of agricultural products grown in the Mouzas. Rice is the most important crop cultivated by the villagers (see Figure 5.6). There are two kinds of rice: Irri (Boro) and Aman. Irri is cultivated as the single most important agricultural product in 14 Mouzas. In the remaining 2 Mouzas, the first product is Aman. Irri, which is named after the International Rice Research Institute, is a species of rice that shows high productivity while Aman is the traditional Bangladeshi species of rice with lower productivity. Agricultural extension workers from the government or NGOs such as BRAC assist farmers in selecting a suitable seed of rice to be planted in their land. Aside from rice, jute, vegetables, pulse and wheat are listed as major crops cultivated in the 16 Mouzas.

c. Public Works Project

There have been public works projects conducted in 14 Mouzas, in which local residents are hired. The daily wage of the projects varies by Mouza and sex (see Table 5.10). The maximum wage is 95 Taka for males in Altapol and 50 Taka for females in Kesabpur. The minimum wage is 30 Taka for males in Sarfabad and 25 Taka for females in Byasdanga, Brahmakati and Sarfabad. In Sarfabad, daily wages for public works projects are the lowest for both sexes. Even though the type of work is the same, the daily wage for male workers is higher than that for female ones. The representative wage (median) for males is 50 Taka per day and that for females is 30.

Table 5.10 Daily Wage of Public Works Projects

	Male	Female
Maximum	95 Tk	50 Tk
Minimum	30 Tk	25 Tk
Median	50 Tk	30 Tk

4) Physical Infrastructure

a. Human Waste Treatment

The most common place where the residents defecate is private toilets without septic tanks (see Table 5.11). There are a few Mouzas where defecation is done in the garden and or the field. Only in Keshabpur, people use private toilets with septic tanks.

Table 5.11 Human Waste Treatment

Private toilets without septic tanks	In the garden/field	Private toilets with septic tanks	Total
12	3	1	16 Mouzas

b. Solid Waste Treatment

In most of the Mouzas, residents dump their garbage in the yard or in the garden (see Table 5.12). Only in Rajnagar Bankabarshi, garbage is picked up by the collection service. In Madhyakul, the most common method of disposing of garbage is burning.

Table 5.12 Solid Waste Treatment

Dumped on to the yard/in the garden	Picked up by garbage collection service	Burnt	Total
14	1	1	16 Mouzas

5) Health Facilities

The accessibility to health facilities is measured by distance to reach them, travel time and cost. The range of distance is from 0.25 in Kesabpur to 5.00km in Rajnagar Bankabarsi. The average distance is 2.30km (see Table 5.13). In every village, people use rickshaws as a way of transportation to get to a hospital. It takes about 20 minutes and costs 5 Tk per trip per person on average. The government health workers visit all 16 Mouzas to provide an outreach service. In 8 Mouzas, the residents are provided such a service on a monthly basis. In other Mouzas such as Khatiakhali, Maguradanga, Sujapur and Altapol, health workers visit more frequently. To the contrary, the service is provided semiannually in Baliadanga.

Table 5.13 Accessibility to Health Facility

Distance	2.30 km
Travel time	20 minutes
Travel cost	5 Tk

6) School Facilities

There are primary schools in 14 Mouzas (see Table 5.14) while secondary schools are in 5 Mouzas. In the Bangladeshi school system, children age 6 to 11 go to primary school. Children from 12 to 17 years old go to secondary school. Schools are operated publicly and privately. There are some private schools in the 16 Mouzas. Most of the schools, however, get subsidies from the government and these schools are regarded as public schools in that respect. Most of the Mouzas have problems with children's school attendance. 9 out of the 16 Mouzas have some children who do not attend primary school. Regarding secondary school, the situation is worse; in all Mouza except Sujapur, there are children who do not attend secondary school.

Table 5.14 Number of Villages with School Facilities

Primary	Secondary
14	5

5.3.2 General Features of Households

This section presents the general features of households in the 16 Mouzas in terms of demography, household economy, water use, arsenic problems and participation in community activities. The following discussion is based on the data gathered from the 112 households interviewed.

1) Demography

a. Household Size and Structure

The household is the smallest unit of social institution. Almost all the socio-economic activities are being performed in this unit. It can be defined as a dwelling unit where one or more persons live and eat together under a common cooking arrangement. Matrimonial, blood or both relations, exist among most of the persons who reside in the dwelling. (Household Expenditure Survey 1995 to 1996, Bangladesh Bureau of Statistics)

In this socio-economic study, there are 112 households sampled. Table 5.15 shows the average household size and structure. The typical household has five to six family members. It consists of two male adults, two female adults, one male child and/or one female child.

Table 5.15 Average Household Size and Structure

	Adult		Child (< 12 years)	
Total	Male	Female	Male	Female
5.53	1.98	2.09	0.75	0.71

2) Household Economy

a. Income

The household annual income has a wide range from about 10,000 to 250,000 Taka (see Table 5.16). As Figure 5.7 shows, the distribution of income amount has a tendency that the higher the income level is, the fewer households there are. 70% of the total households have an annual income of less than 50,000 Taka. Taking the median as a representative of income amount, it is estimated 36,350 Taka. As for income source, salaried work accounts for 41.2%; self-employed work, 31.9%; crop selling, 14.3%; livestock selling, 4.8%; fish selling, 1.6%; and other, 6.2% (see Figure 5.8). As Figure 5.9 shows, "sales/business (a kind of brokerage)" shares 60.3% of the salaried work, followed by "transportation/vehicle operation" (7.9%) and "professional (such as school teachers)" (4.8%). In salaried work, "transportation/vehicle operation" and "service" has the highest share of 15.6% each, followed by "professional" (5.2%), "factory (manufacturing)" (3.9%) and "construction" (2.6%).

Table 5.16 Household Annual Income

Maximum	246,310 TK
Minimum	10,235 TK
Median	36,350 TK

To measure the economic status, the material of the roof at each household is also observed. 65.2% of households use earthen tiles as roofing material, 19.6% of households use tin, and 12.5% of households reside in a building with a concrete roof. Only 1.8% of households live in a house with a roof thatched with straw or grass.

b. Expenditure

The annual expenditure varies widely by household (see Table 5.17). On one hand, one household spends more than 200,000 Taka, and on the other hand, one less than 7,000 Taka. Figure 5.10 shows the distribution of the households' annual expenditure. The median is 34,157 Taka. In the same way as the income level mentioned previously, most of households are in the lower range. 70% of the households spend less than 50,000 Taka annually. Regarding the expenditure pattern, 50.8% of total expenditure is spent on food; 9.4% on medical care; 7.3% on clothes; 4.5% on transportation; 3.0% on fuel/kerosene; 2.9% on school/education; 1.2% on electricity; and 20.8% on savings and other (see Figure 5.11).

Table 5.17 Household Annual Expenditure

Maximum	205,176 Tk
Minimum	6,930 Tk
Median	34,157 Tk

3) Water Use

a. Water Source

There are five different kinds of water sources in the Mouzas (see Table 5.18). Residents change water sources to suit their needs. There is not much difference in the use of water sources between the dry and wet season. Only a small percentage of households use rainwater for cooking in the wet season. Well water is used by almost all households for drinking purposes (see Figure 5.12). About 70% of the households use pond water for cooking. To wash food and utensils, well water is used by about 60% of the households. When residents bathe, they use pond water. Washing clothes is also done, using pond water.

Table 5.18 Water Source

Source	Drinking		Cooking		Washing food and utensils		Personal washing		Washing of clothes	
	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet
Well	97.3	97.3	28.6	29.5	60.7	63.4	4.5	3.6	8.0	6.3
River	..	..	..	..	..	..	0.9	0.9	0.9	0.9
Pond	..	..	70.5	66.1	39.3	36.6	94.6	95.5	91.1	92.9
Water delivered	2.7	2.7	0.9	0.9	..	..	..	..	..	..
Rain	..	..	..	3.6	..	..	..	..	..	..
Total (%)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

b. Water Consumption

Since bathing and washing clothes are generally done in and beside ponds, residents do not collect water for these purposes. It is therefore unknown how much water they consume to bathe and to wash their clothes. Table 5.19 shows that for drinking, cooking and washing food and utensils, a total 85 liters of water is consumed per household (median of total households' water consumption). Regarding arsenic poisoning, attention should be paid to the amount of water consumed for drinking and cooking purposes. The typical household consumes total 45 liters of water for drinking and cooking.

Table 5.19 Daily Water Consumption per Household

Drinking	Cooking	Washing food & utensils	Total
19	26	40	85 liter

c. Water Fetching

Women collect water. As Figure 5.13 shows, in almost all households water fetching is a job of women. Men collect water in only a small percentage of households, but this includes those who deliver water as their business or serve as servants. It is rare for children younger than twelve years old to fetch water. Children collect water in only less than 2% of the households.

The time spent on collecting drinking water varies widely by household. The required time ranges from a few minutes to more than two hours (see Table 5.20). The median is 20 minutes. This time includes not only reaching a water source and coming back to one's house, but also

the actual operation time of the water facilities such as hand pumps.

Table 5.20 Time Spent on Water Fetching

Maximum	140 min.
Minimum	2 min.
Median	20 min.

d. Water Quality

Villagers think the quality of drinking water they consume everyday is good (see Table 5.21). In terms of taste and clearness of drinking water, about 90% of the households are satisfied with its quality. As most of them use well water for drinking purposes, it is said that villagers rely on the quality of well water.

Table 5.21 Villagers' Impression about Water Quality

Taste		Smell		Clearness	
Good	Bad	Good	Bad	Good	Bad
92.9	7.1	83.9	16.1	87.5	12.5
100.0%		100.0%		100.0%	

4) Arsenic Problems

a. Knowledge about Arsenic Poisoning

In most of the households, residents have heard about arsenic poisoning but they do not have much knowledge about it. 91.1% of the total households are familiar with the word "arsenic". Among these households, however, only 51.0% of them know the symptoms, 63.7% know the causes and 58.8% know prevention methods (see Table 5.22).

Table 5.22 Knowledge about Arsenic Poisoning

Symptom	Cause	Prevention method	Total (actual)
51.0	63.7	58.8	100.0% (102)

Figure 5.14 tells us that about 45% of those who have heard about arsenic poisoning know about "melanosis (wart-like hardening of the skin)" as a symptom, about 25% know of "kerotosis (dark spots on the skin)," and about 10% know of "ulcers". Only a few people know about "Gangrene" and other symptoms such as cancer as symptoms of arsenic poisoning. Regarding the causes of arsenic poisoning, as Figure 5.15 indicates, more than 60% of the households that have heard about the problem think drinking arsenic contaminated water causes it. Of them, about 60% think they can prevent poisoning by not drinking arsenic contaminated water (see Figure 5.16).

b. Willingness to Obtain Arsenic Safe Water

Here we take a look at villagers' willingness to obtain arsenic safe water. Villagers were asked about their willingness based on the assumption that: (1) public water taps are available within 100 m distance or three minutes on foot; (2) they provide high quality water that is totally arsenic free; (3) the taps are open from 7:00 a.m. in the morning until 7:00 p.m. in the afternoon. Table 5.23 shows villagers' willingness in terms of cost and time required. Villagers' willingness to shoulder the cost or willingness to pay (WTP) for safe water varies by household. The maximum WTP is 300 Taka per month while the minimum is 0 Taka. We see from Figure 5.17 that most households' WTP is within the range of 0 to 60 Taka where the median is 30 Taka.

The willingness to spend extra time for obtaining water has a range of 2 to 30 minutes per roundtrip. The median of time is 10 minutes. As has been pointed out, villagers spend 20 minutes to fetch drinking water now. They would spend a total of 30 minutes to collect arsenic safe water.

Table 5.23 Willingness for Obtaining Arsenic Safe Water

	Cost per month	Time per roundtrip
Maximum	300 Tk	30 min.
Minimum	0 Tk	2 min.
Median	30 Tk	10 min.

5) Participation in Community Activity

As previously mentioned in 5.3.1-2)-(b), there are several community activities conducted by villages: health programs, mutual assistance, construction and maintenance of infrastructure and cleaning of the environment. Table 5.24 shows that participation in mutual assistance and health programs is high. 91.1% of households have been involved in community-sponsored programs that provide mutual assistance. 88.4% of the households have joined community-sponsored health programs. To the contrary, fewer households take part in group efforts to build or repair infrastructure and to clean up the environment. The percentage of households that have participated in these activities are 51.8 and 24.1% respectively.

Table 5.24 Participation in Community Activity

	Participated	Not participated	Total (actual)
Health program	88.4	11.6	100.0% (112)
Mutual assistance	91.1	8.9	100.0% (112)
Construction and maintenance of infrastructure	51.8	48.2	100.0% (112)
Cleaning the environment	24.1	75.9	100.0% (112)

5.3.3 Consideration on Sustainability of Improved Water Supply System

There are many aspects to be considered from a socio-economic standpoint when we discuss about sustainability of the improved water supply system. However, it is impossible to talk about all related elements at once. Therefore, in this section we mainly focus on the financial side of the socio-economic condition of villagers in the Mouzas, explore their ability and willingness to sustain the water system and reveal the key factors that influence villagers' willingness to operate and maintain the system.

1) Ability to Pay for Improved Water Supply System

Villagers in the Mouzas have the ability to pay about 91 Taka per month per household for improved water supply systems. Can community residents bear the operation and maintenance (O&M) cost of improved water supply systems? If so, how much are they willing to pay for it? These are the two major questions that any planner of water supply systems has to make clear. As has been pointed out, the annual income of a household is 36,350, or 3,029 Taka on a monthly basis. In general, it is assumed that people can afford to pay a fixed proportion of three to five percent of their income for a water service though this assumption is often criticized as being too simplistic. Taking three percent of income as an indicator of villagers' affordability to pay for the improved water service, it is 90.9 Taka per month (three percent of the income of 3,029). This amount of 90.9 Taka per month per household is to recover the cost of O&M of the hand pump water supply system (Level 1).

2) Willingness to Pay for Improved Water Supply System

Even if villagers can afford to, they may still be unwilling to pay. As we discussed in 5.3.2-4)-(b), villagers' willingness to pay (WTP) for safe water is 30 Taka per month per household. This amount accounts for about 1% of the monthly income of 3,029 Taka. With 30 Taka per month per household, it is expected that the cost of O&M for the hand pump water supply system (Level 1) can be recovered. However, this amount is only about one third of 91 Taka, the amount that villagers are able to pay.

3) Factors Influencing Willingness to Pay

In this section, taking three factors: income, knowledge about arsenic poisoning and community cohesion as variables, whether there is any relationship between these variables and villagers' willingness to pay (WTP) is discussed. The statistical test (chi-square test) was used to examine the significance of the relationship between the variables. Let us begin first with the relationship between villagers' income and their willingness to pay for improved water supply systems.

a. Income and Willingness to Pay

Villagers' income has a deep connection with their willingness to pay (WTP) for improved water supply systems. The 112 households surveyed are categorized into two groups in terms of income and WTP. To categorize households, the mean of both income and WTP amount is used. As Table 5.25 shows (see also Figure 5.18), there are 56 households in the category "Income > 36,350 Taka" while the remaining 56 households are classified into the category "Income < 36,350 Taka." 60.7% in the category "Income > 36,350 Taka" are willing to pay more than 30 Tk per month, the mean of WTP. On the contrary, 23.2% of households in the category "Income < 36,350 Taka" express a monthly WTP of more than 30 Taka.

Table 5.25 Relationship between Income and WTP

	WTP>30Tk	WTP<30Tk	Total (actual)
Income>36,350Tk	60.7	39.3	100.0% (56)
Income<36,350Tk	23.2	76.8	100.0% (56)
Total	42.0	58.0	100.0% (112)

*Significant at the 95% confidence level (p-value: 0.0001)

Statistical analysis (chi-square test) is conducted where:

H_0 = there is no relationship between variables

H_1 = there is a relationship between variables

The null hypothesis can be rejected at the 95% confidence level.

b. Knowledge about Arsenic Poisoning and Willingness to Pay

Villagers' knowledge about arsenic poisoning is not irrelevant to their willingness to pay for safe water. Taking knowledge about symptoms as an indicator, the relationship between the two variables, knowledge about arsenic poisoning and WTP, is examined. Table 5.26 describes that there are 52 households who know about at least one symptom of arsenic poisoning while the remaining 60 households do not have any knowledge about it. There is not much difference between the percentage of those who know about symptoms with a WTP of over 30 Taka and that of those with a WTP equal to or less than 30 Taka. However, there is a clear difference in the category "Do not know about symptoms" where 33.3% of households show a WTP of more than 30 Taka; the remaining 66.7% of the households express a less amount (see Figure 5.19). Compared with the relationship between the income level and WTP, the confidence level of the statistical test is lower but there is relevance between knowledge about arsenic poisoning and WTP.

Table 5.26 Relationship between Knowledge about Arsenic Poisoning and WTP

	WTP>30Tk	WTP<30Tk	Total (actual)
Know about symptoms	51.9	48.1	100.0% (52)
Do not know about symptoms	33.3	66.7	100.0% (60)
Total	42.0	58.0	100.0% (112)

*Significant at the 90% confidence level (p-value: 0.0725)

c. Community Cohesion and Willingness to Pay

The stronger the community cohesion is, the higher willingness to pay the villagers show for improved water supply systems. The cohesiveness of a community is measured by villagers' participation in four community activities such as health programs, mutual assistance, construction and maintenance of infrastructure and cleaning the environment. A household whose members have participated in more than two out of the four community activities is categorized as one with a strong feeling of cohesiveness with the community. We see from Table 5.27 that there are 55 households categorized in "cohesion strong" and 57 households in the category "cohesion weak". Now classifying these two groups of households by WTP, the same trend as the previous case of the knowledge about arsenic poisoning is observed (see Figure 5.20); about 70% of the households classified in the category "cohesion weak" show a monthly WTP equal to or less than 30 Taka while there is not much difference by the WTP level in the category of "cohesion strong". The statistical test shows a highly significant relationship between community cohesion and WTP.

Table 5.27 Relationship between Community Cohesion and WTP

	WTP>30Tk	WTP<30Tk	Total (actual)
Cohesion strong	52.7	47.3	100.0% (55)
Cohesion weak	31.6	68.4	100.0% (57)
Total	42.0	58.0	100.0% (112)

*Significant at the 95% confidence level (p-value: 0.0379)

5.4 Conclusion and Recommendation

The study reveals the general features of the target area including the 16 Mouzas from a socio-economic point of view. A number of indicators are presented to describe the characteristics of the 16 Mouzas and households. Based on these indicators or data, the financial sustainability is, then, discussed. Although households in the 16 Mouzas have the ability to pay about 91 Taka per month per household for improved water supply systems, the amount they are willingness to pay (WTP) is only 30 Taka, or one third of the ability. With this WTP, it is the hand pump water supply system (Level 1) whose costs will be recovered.

Incidentally, it becomes clear that the households with knowledge about arsenic poisoning would show a higher WTP than the ones without it. Likewise, the households with strong

cohesiveness with their community have a tendency to express more willingness to pay for safe water, compared with the ones with less feeling of community cohesion. These results imply that by raising villagers' knowledge level of arsenic poisoning and/or cohesiveness with their own community, villagers would show a higher amount of WTP. Therefore, it seems reasonable to conclude that the activities to raise villagers' awareness about arsenic poisoning and/or consciousness of being a member of the community are necessary to satisfy financial requirements for the operation and maintenance of water supply systems when they are to be introduced. As a result of these activities, the financial sustainability of the systems would be secured.

Precondition for the construction of the improved water supply systems

Development of awareness among villagers about arsenic poisoning by information dissemination and training through:

- Organizing local residents and/or revitalizing existing organizations such as Arsenic Committees
- Building a partnership between the government and NGOs such as DPHE, Asia Arsenic Network and Family Planning Association of Bangladesh

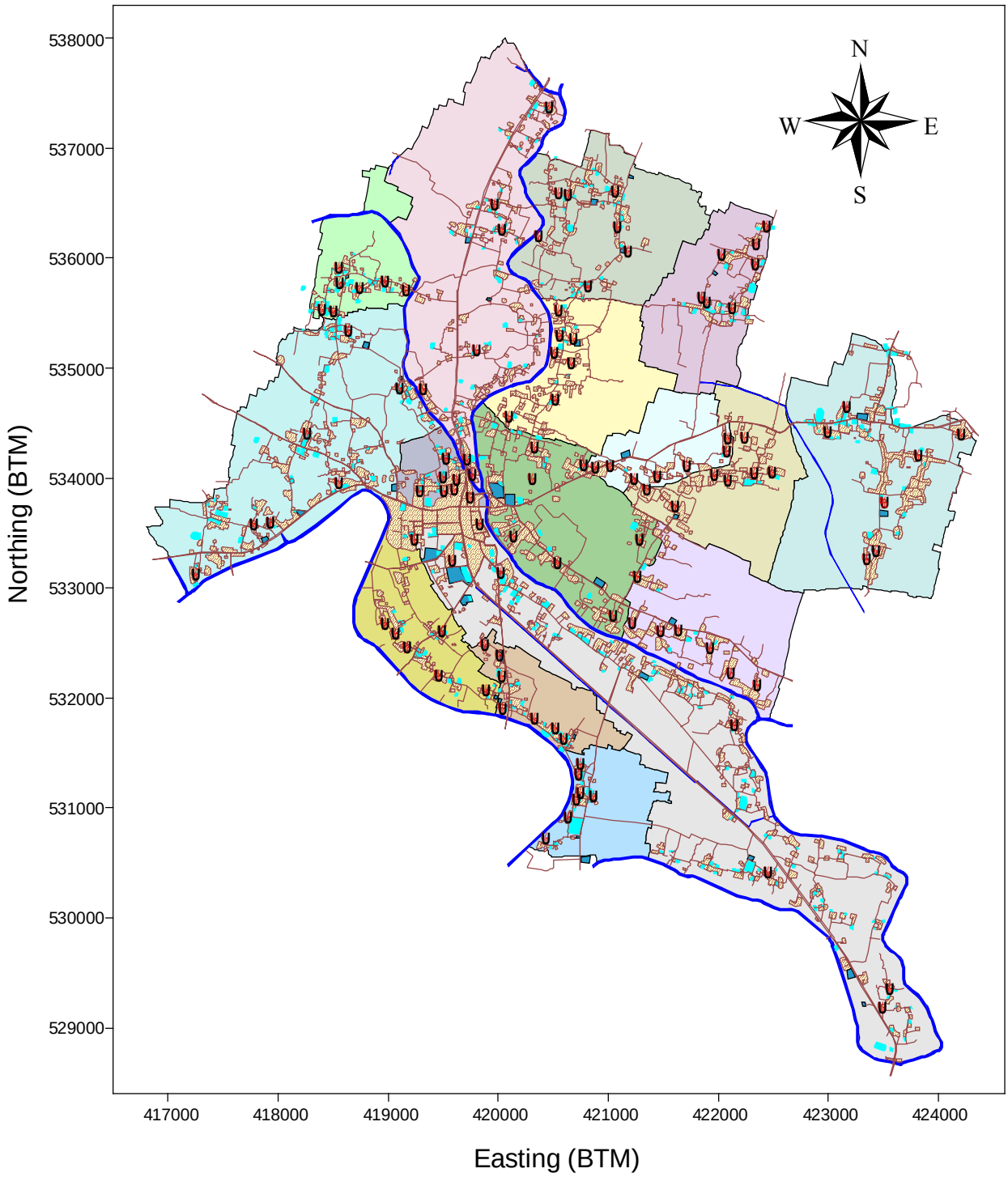
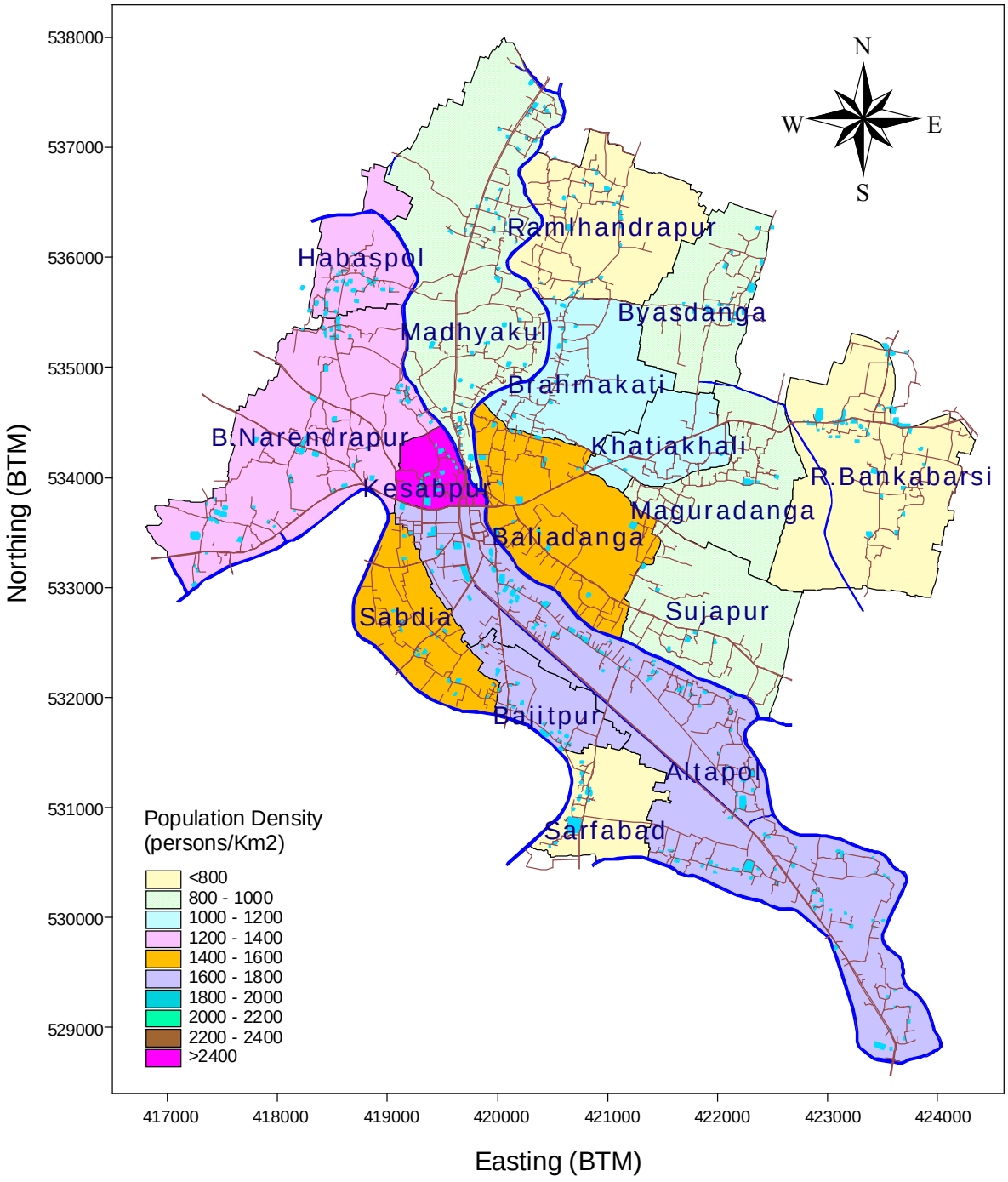


Figure **5.1**	**Location of Visited Households in Socio-economic Survey in Jan and Feb, 2002**
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	



Population data are obtained from interview in Feb. 2002.

Figure **5.2**	Population Density Distribution in the the Supplementary Survey Area
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

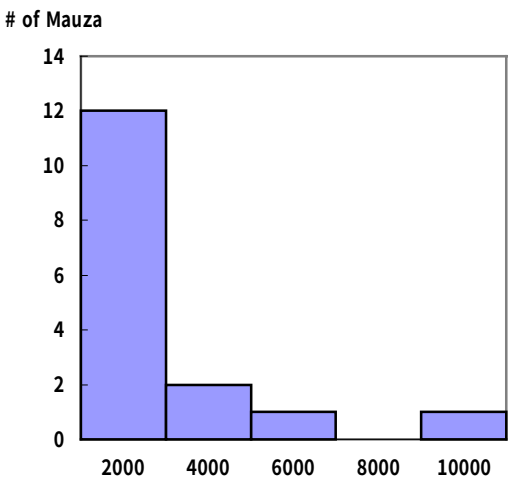


Figure 5.3 Population of Mouza

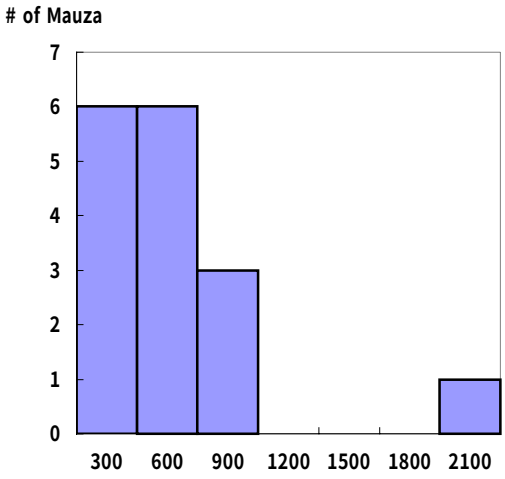


Figure 5.4 Number of Households in Mouza

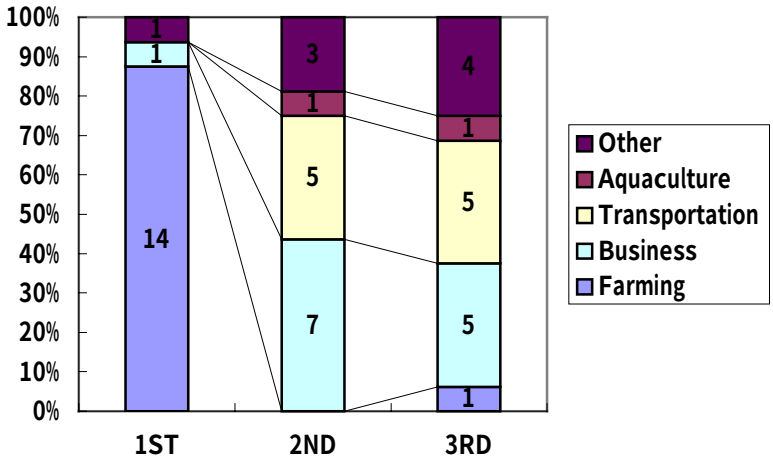


Figure 5.5 Major Industries in Mouza

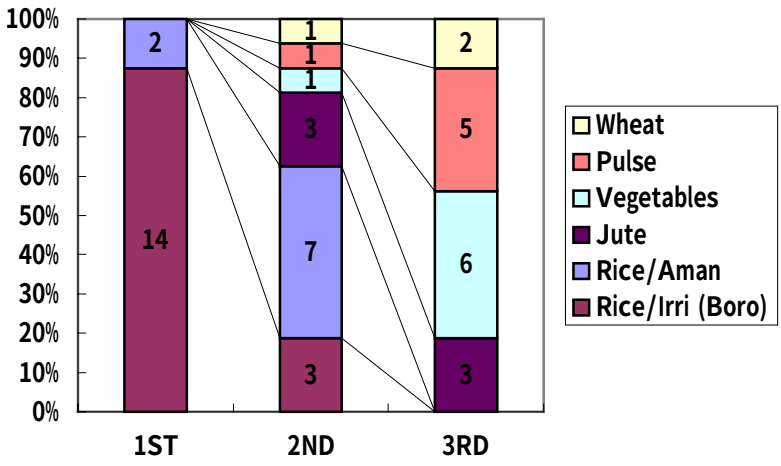


Figure 5.6 Agricultural Products

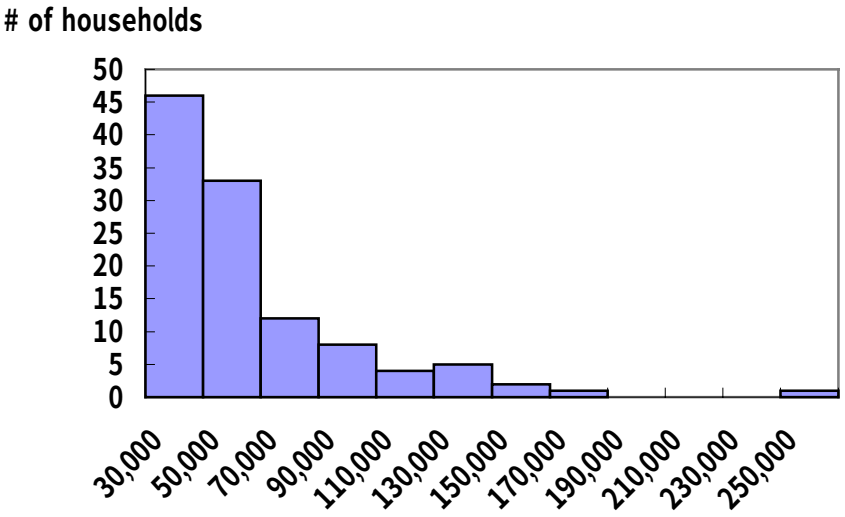


Figure 5.7 Household Annual Incomes

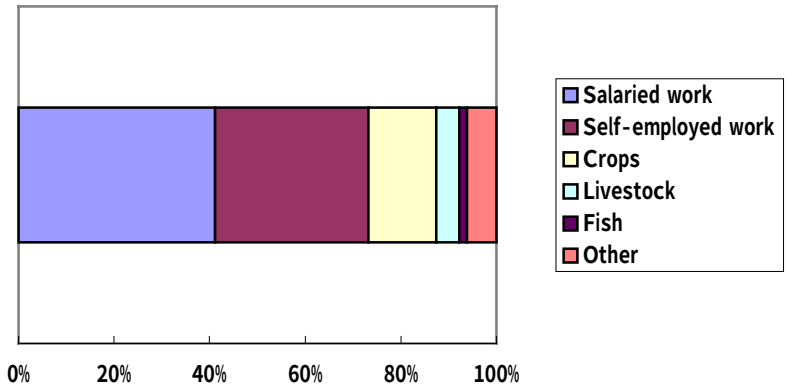


Figure 5.8 Source of Household Income

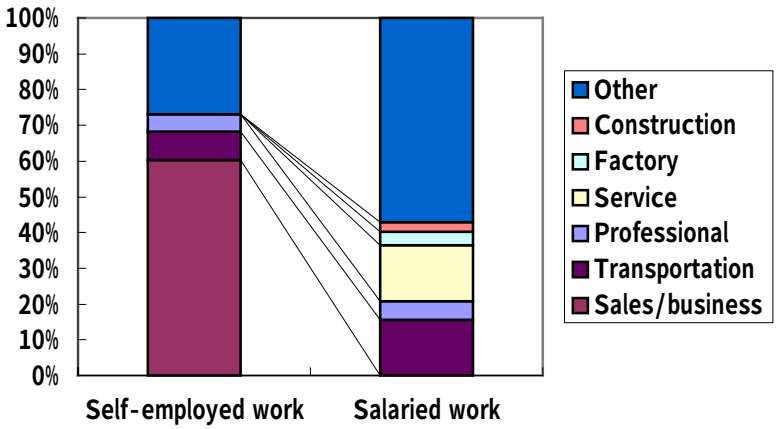


Figure 5.9 Self-employed and Salaried Work

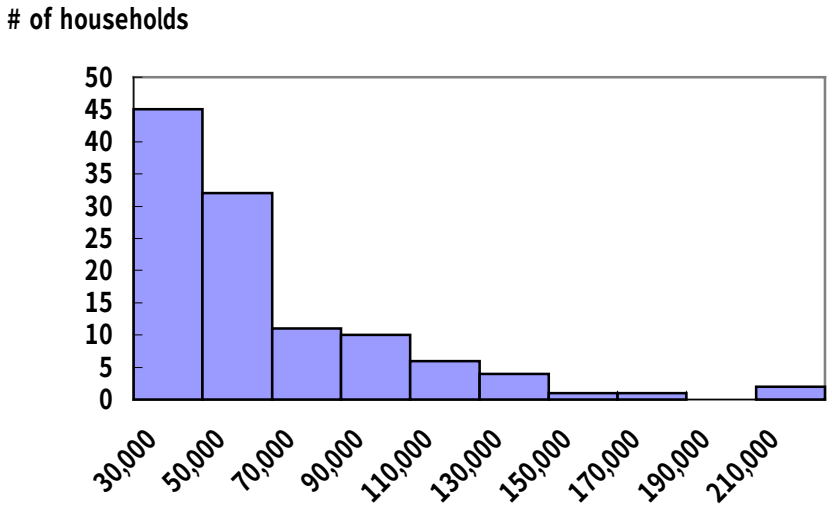


Figure 5.10 Household Annual Expenditure

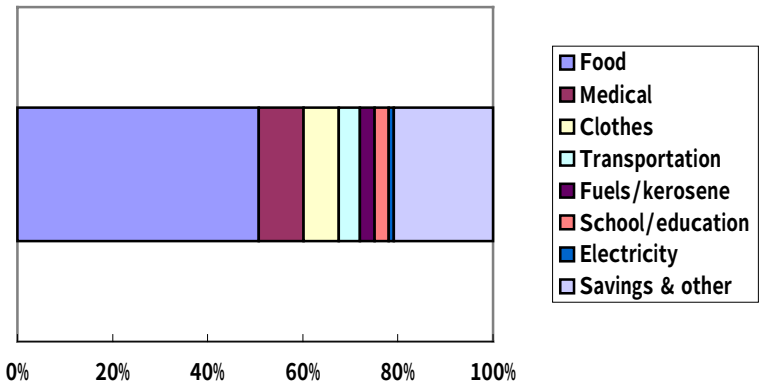


Figure 5.11 Household Expenditure Pattern

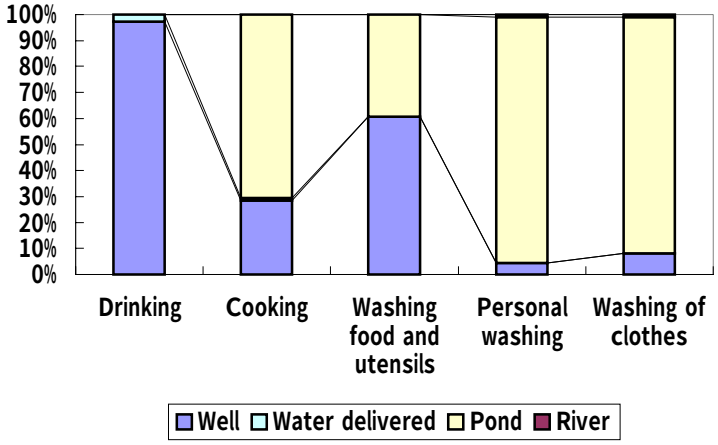


Figure 5.12a Water Source (Dry Season)

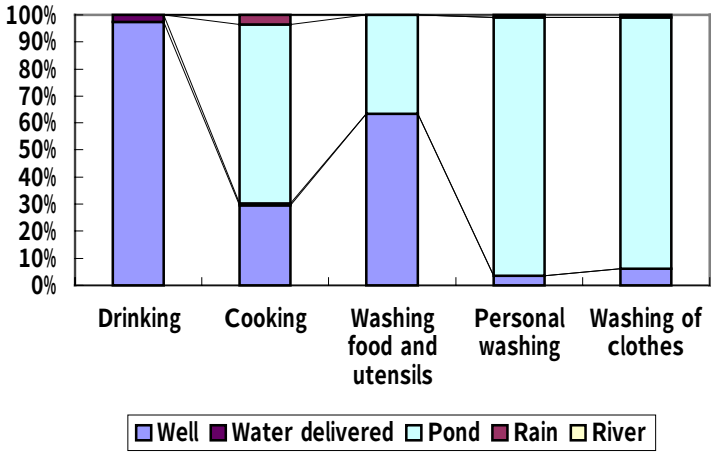


Figure 5.12b Water Source (Wet Season)

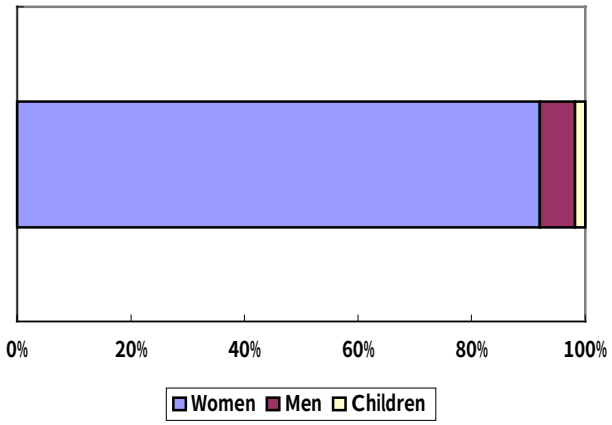


Figure 5.13 Person in Charge of Water Collection

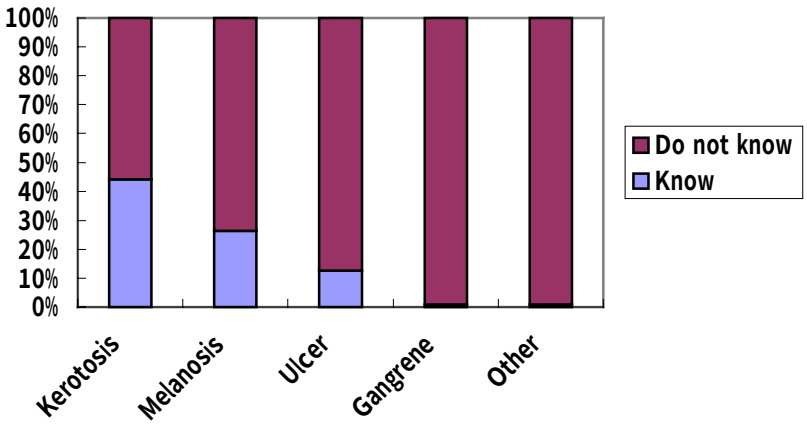


Figure 5.14 Knowledge about Symptoms of Arsenic Poisoning

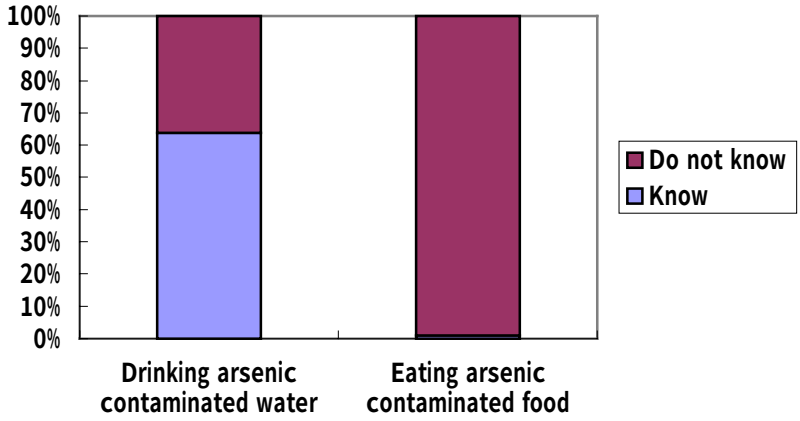


Figure 5.15 Knowledge about Causes of Arsenic Poisoning

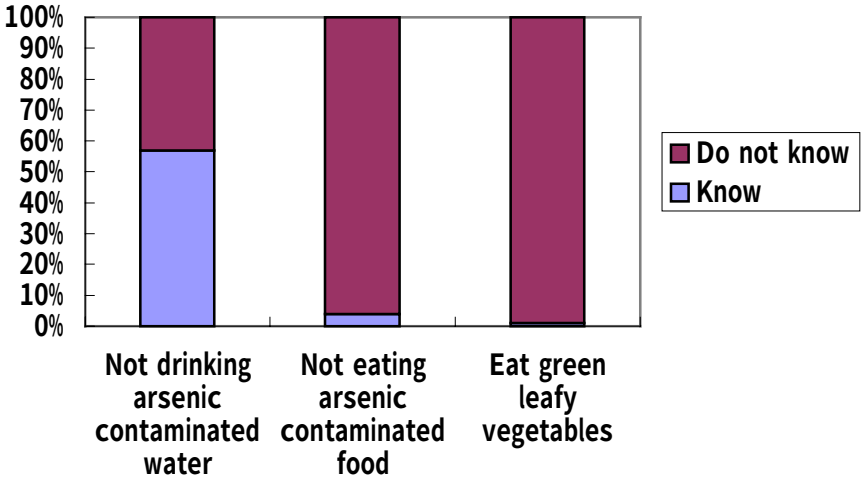


Figure 5.16 Knowledge about Prevention Methods of Arsenic Poisoning

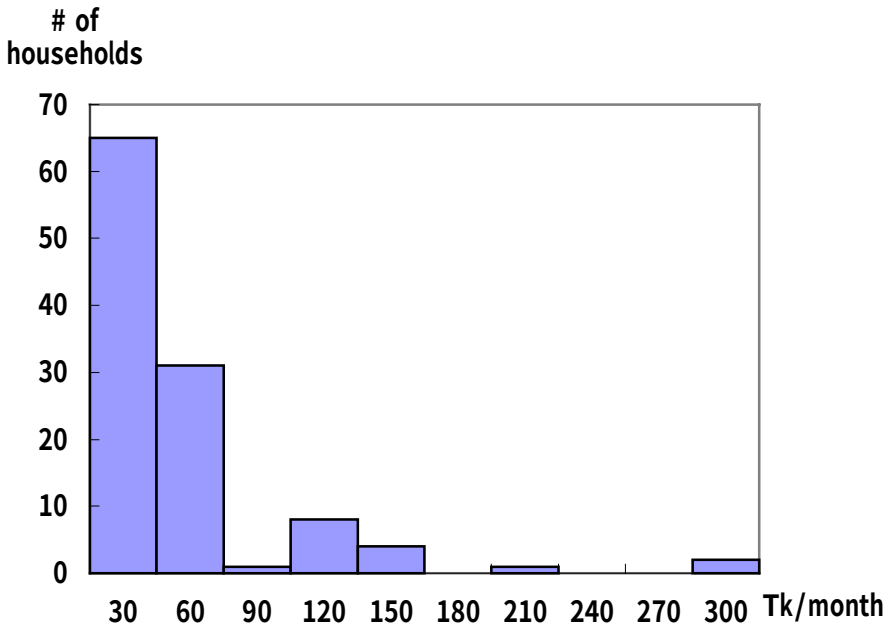


Figure 5.17 Willingness to Pay for Arsenic Safe Water

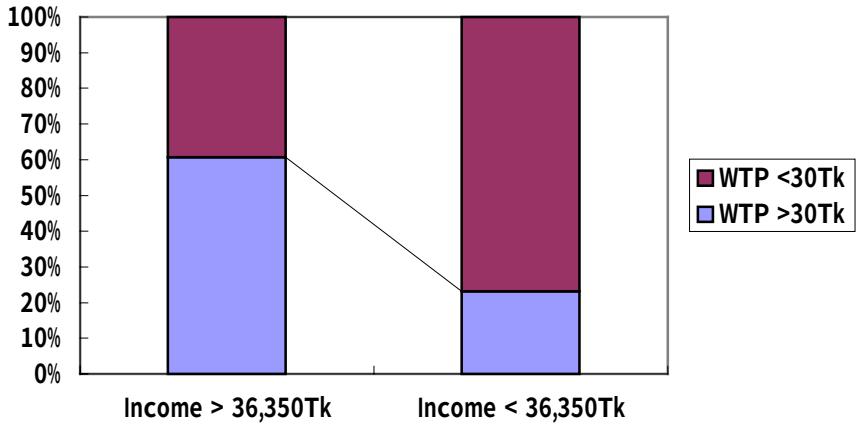


Figure 5.18 Relationship between Income and Willingness to Pay

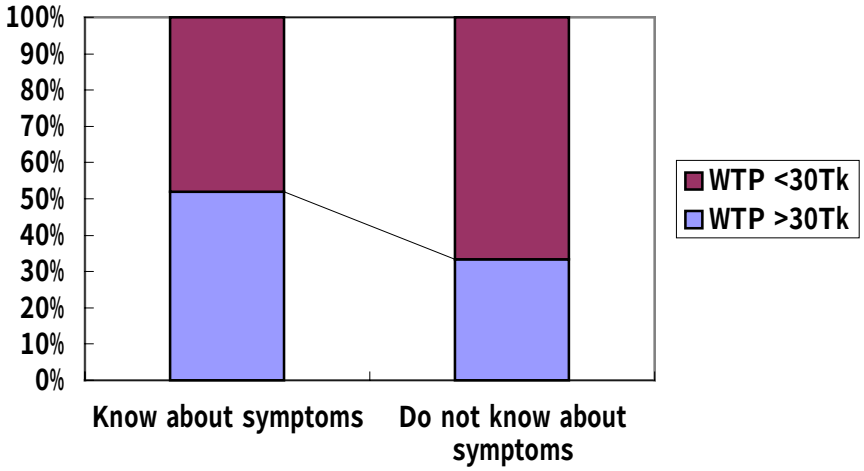


Figure 5.19 Relationship between Knowledge about Symptoms and Willingness to Pay

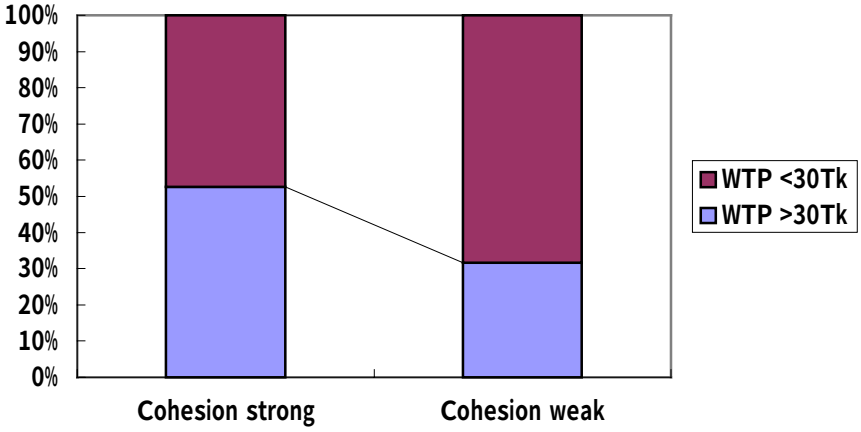


Figure 5.20 Relationship between Community Cohesion and Willingness to Pay

Annex 5.1 Community Questionnaire

Mouza (CD)		Date of visit (Month/Date/Year)	/ /2002
Village		Interviewer	

Section 1: Respondent characteristics

Could you please answer a few questions about yourselves before we begin the interview?

1. What is your full name?	2. How old are you? Years	3. Sex 1. Male 2. Female	4. What is your occupation?	5. What position do you have in this community? 1. Leader 2. Secretary 3. Agriculture extension worker 4. Health provider 5. Other (specify_____)

Section 2: Basic physical and demographic characteristics of the community

1. What is the most common use of land in this community?

1. Planned housing
2. Squatter settlement
3. Farming/fisheries/estates
4. Industry/ manufacture
5. Shops
6. Other (specify_____)

2. How many households are found in this community?

[ ] households

3. What are the major religions practiced by residents of this community?

Religion	Approximate estimate of percent or proportion
1. Buddhist	
2. Christian	
3. Hindu	
4. Muslim	
5. Traditionalist/animist	
6. Other (specify_____)	
Total	100%

Section 3: Community activities

1. How is the leader of this community chosen?

1. Elected
2. Appointed by elders
3. Appointed by administration
4. Inherited
5. Other (specify_____)

2. Are there organized meetings of community residents to discuss community issues and events?

1. Yes
2. No (→5)

3. How often are these meetings held?

1. Day
2. Week
3. Month
4. Quarter
5. Half year
6. Year

4. About how many people attend?

_____ people

5. In this community, have there been group efforts to clean up the environment within the past 5 years? (Cleanliness)

1. Yes
2. No

6. In this community, have there been group efforts to build or repair infrastructure within the past 5 years?

1. Yes
2. No

7. In this community, has there been a community sponsored health program within the past 5 years?

1. Yes
2. No

8. In this community, have there been community sponsored programs to provide mutual assistance?

1. Yes
2. No

Section 4: Economy

1. Which activities are the three most important sources of employment for individuals in this community?

1ST ☐ 2ND ☐ 3RD

1. Farming
2. Aquaculture
3. Building construction
4. Retail (Shops)
5. Transportation (Rickshaw)
6. Business
7. Other (specify_____)

2. Do people in this community leave temporarily during certain times of the year to look for work elsewhere?

1. Yes
2. No (→4)

3. What type of work do they look for?

1. Professional
2. Sales/business
3. Service
4. Farm, forestry, fishing
5. Factory
6. Transportation/vehicle operation
7. Construction
8. Other (specify_____)

4. Do people come to this community during certain times of the year to look for work from elsewhere?

1. Yes
2. No (→6)

5. What type of work do they look for?

USE THE SAME CODES AS IN QUESTION 3

6. Please list the three most important crops cultivated by residents of this community, in order of importance. 1. Rice/Aman 2. Rice/Iri 3. Rice/Boro 4. Wheat 5. Maize 6. Cassava 7. Yams 8. Vegetables 9. Bananas 10. Cotton 11. Cocoa 12. Coconuts 13. Jute 14. Pulse 15. Other (specify_____)	7. How many times is this crop harvested each year? Times
1ST:	
2ND:	
3RD:	

8. In this community, is there any public works project that hires community residents who are in need of work?

1. Yes
2. No (→Next section)

9. What is the daily wage of an adult male laborer in this public works project?

[ ] Tk./day

10. What is the daily wage of an adult female laborer in this public works project?

[ ] Tk./day

Section 5: Water source

1. What is the main source of drinking water for the residents of this community during the wet season?

1. Well water
2. Spring water
3. Rain water
4. River water
5. Pond
6. Water delivered by tanker truck/barrel
7. Bottled water
8. Other (specify_____)

2. What is the main source of drinking water for the residents of this community during the dry season?

USE THE SAME CODES AS IN QUESTION 1

3. During the dry season, are water shortages a problem in this community?

1. Yes
2. No

4. How many wells are in this community, used for drinking water?

_____ wells

Owner	5. Who owns those wells? ASK QUESTION 5 FOR ALL ITEMS BEFORE GOING TO QUESTION 6-7	6. At how many wells, water supply facilities such as pumps are NOT optimally maintained?	7. What is the reason for water supply facilities NOT optimally maintained? 1. Lack of technical skills 2. Lack of motivation 3. Cost and availability of spare parts 4. Other (specify_____)
1. Individuals			
2. Group			
3. Government			
4. NGO/JICA			
5. Other			
Total			

8. How many wells are in this community, used for agricultural use?

[ ] wells

Owner	9. Who owns those wells? ASK QUESTION 9 FOR ALL ITEMS BEFORE GOING TO QUESTION 10-11	10. At how many wells, water supply facilities such as pumps are NOT optimally maintained?	11. What is the reason for water supply facilities NOT optimally maintained? 1. Lack of technical skills 2. Lack of motivation 3. Cost and availability of spare parts 4. Other (specify_____)
1. Individuals			
2. Group			
3. Government			
4. NGO/JICA			
5. Other			
Total			

Section 6: Arsenic problems

1. In this community, have there been arsenic surveys such as arsenic test of well water conducted?

1. Yes
2. No

2. Are there any patients who suffer from arsenic poisoning in this community? How many?

[ ] person(s)

3. What actions are taken for arsenic problems?
[MULTIPLE ANSWER]

☐1. Organize meetings of community residents to discuss arsenic problems
☐2. Establish a committee to deal with arsenic problems
☐3. Invite a knowledgeable person to provide information about causes of and ways to prevent arsenic poisoning
☐4. Disseminate knowledge about symptoms and causes of arsenic poisoning to community residents
☐5. Disseminate information on prevention methods to community residents
☐6. Ask government/NGOs to provide assistance
☐7. Other (specify_____)

4. Are there any NGOs which conduct activities related to arsenic poisoning ?	1. Yes 2. No	Name of NGO
1. Arsenic test of well water		
2. Diagnosis of patients		
3. Dissemination of knowledge about symptoms and causes of arsenic poisoning		
4. Dissemination of information on prevention methods		
5. Selling/giving goods to obtain arsenic-free water such as arsenic removal pots and chemical packets		
6. Financial assistance for patients of arsenic poisoning		
7. Mental assistance for patients of arsenic poisoning		
8. Other (specify_____)		

Section 7: Sanitation

1. What is the most common place where the residents of this community defecate?

1. Private toilets without septic tanks
2. Common toilets shared with neighbors
3. Public lavatory
4. In the garden/field
5. In the river
6. In drainage ditches
7. Other (specify_____)

2. What is the most common methods to dispose of the garbage in this community population?

1. Picked up by garbage collection service
2. Burnt
3. Thrown to the river
4. Dumped on to the yard/in the garden
5. Buried
6. Other (specify_____)

Section 8: Health

1. How far is the nearest hospital from the community?

[ ] kilometer

2. What means of transportation is most often used to travel to the hospital?

1. Bus
2. Rickshaw/van
3. Cart drawn by animal
4. Walking
5. Other (specify_____)

3. How much does it cost to use this mode of transportation to travel to the hospital from the community?

[ ] Tk./person

4. How long does it take to use this mode of transportation to travel to the hospital from the community?

[ ] hours

5. Do government health workers ever visit this community to provide health services?

1. Yes
2. No (→Next section)

6. How often do government health workers visit this community to provide outreach services?

1. Day
2. Week
3. Fortnight
4. Month
5. Quarter
6. Half year
7. Year

Section 9: Education

1. Are there primary schools in this community? (6 to 11 years)

1. Yes
2. No (→4)

2. Who operates these primary schools?

1. Government
2. Private
3. Both

3. How far is it to the nearest primary school from the center of the community? The center means a vital point of the community.

[ ] kilometer

(→5)

4. How far is the nearest primary school from the community?

[ ] kilometer

5. Are there any children of primary school age that do not attend primary school in this community?

1. Yes
2. No

6. Are there secondary schools in this community? (12 to 17 years)

1. Yes
2. No (→9)

7. Who operates these secondary schools?

1. Government
2. Private
3. Both

8. How far is it to the nearest secondary school from the center of the community? The center means a vital point of the community.

[ ] kilometer

(→10)

9. How far is the nearest secondary school from the community?

[ ] kilometer

10. Are there any children of secondary school age that do not attend secondary school in this community?

1. Yes
2. No

11. How many men over 15 years old can read and write in this community?

1. A few	< 20%
2. Less than half	< 50%
3. Half	= 50%
4. More than half	> 50%
5. Almost	> 80%

12. How many women over 15 years old can read and write in this community?

USE THE SAME CODES AS IN QUESTION 11

Annex 5.2 Household Questionnaire

Mouza (CD)		Date of visit (Month/Date/Year)	/ /2002
Village		Interviewer	
House #		Interviewee 1	
Name of household head		Interviewee 2 [IF ANY]	

Number of household members

Adults		Children < 12 years		
M	F	M	F	
				Σ

GPS (LAT/LON)	UTM

Section 1: Economic status [DIRECT OBSERVATION]

1. Material of a roof

    1. Straw/grass
    2. Earthen tile
    3. Tin
    4. Concrete
    5. Other (specify_____)

Section 2: Water use

1. What water source do you mainly use for the following activities?

Season	Activity	Water source 1. Well water 2. Spring water 3. Rain water 4. River water 5. Pond 6. Water delivered by tanker truck/barrel 7. Bottled water 8. Other
1. Dry	1. Drinking	
	2. Cooking	
	3. Washing food and utensils	
	4. Personal washing	
	5. Washing of clothes	
	6. Other	
2. Wet	1. Drinking	
	2. Cooking	
	3. Washing food and utensils	
	4. Personal washing	
	5. Washing of clothes	
	6. Other	

2. [IF THE RESPONDENT ANSWERS "WATER DELIVERED BY TANKER TRUCK/BARREL" OR "BOTTLED WATER," ASK] How much does one liter of water delivered by tanker truck/barrel or bottled water cost?

[ ] Tk./liter

3. Who mainly collects the water?

1. Children (< 12 years)
2. Women
3. Men

4. How much water is collected each time?

[ ] liters

5. How many times in a day is water collected?

[ ] times

6. How long does it take to go to the water source, fetch water and come back?

[ ] minutes

7. For what purpose is the water collected being used?

Activity	Liters
1. Drinking	
2. Cooking	
3. Washing food and utensils	
4. Personal washing	
5. Washing of clothes	
6. Other	
Total	

8. Is the taste of drinking water you get from the water source good?

1. Yes
2. No

9. How about smell of drinking water? Is it good?

1. Yes
2. No

10. How about clearness of drinking water? Is it clear?

1. Yes
2. No

Section 3: Arsenic problems

1. Have you ever heard about arsenic poisoning?

1. Yes
2. No [TELL SYMPTOMS, CAUSES & PREVENTION METHODS]

2. What are the symptoms?
[DO NOT READ ANSWERS. MULTIPLE ANSWER]

☐1. Dark spots on skin
☐2. Wart-like hardening of skin
☐3. Ulcer
☐4. Gangrene
☐5. Other (specify_____)

3. What is the cause of arsenic poisoning?
[DO NOT READ ANSWERS. MULTIPLE ANSWER]

☐1. Do not know
☐2. Drinking arsenic contaminated water
☐3. Eating arsenic contaminated food
☐4. Physical contact with patients of arsenic poisoning
☐5. Other (specify_____)

4. Do you practice any prevention methods to avoid arsenic poisoning?
[MULTIPLE ANSWER]

☐1. Do nothing
☐2. Not drinking arsenic contaminated water
☐3. Not eating arsenic contaminated food
☐4. Not physical contact with patients of arsenic poisoning
☐5. Eat green leafy vegetables
☐6. Other (specify_____)

5. Are there any patients who suffer from arsenic poisoning in your family? How many?
[IF NONE GO TO NEXT SECTION]

_____ person(s)

6. What kind of symptoms do they have?
[MULTIPLE ANSWER]

☐1. Dark spots on skin
☐2. Wart-like hardening of skin
☐3. Ulcer
☐4. Gangrene
☐5. Other (specify_____)

7. Did they receive medical treatment?

1. Yes
2. No (→Next section)

8. Who provides medical treatment? ASK QUESTION 8 FOR ALL ITEMS BEFORE GOING TO QUESTION 9 Provider name	1. Yes 2. No	9. How many times did patients receive medical treatment from the provider during the past one year?
1. Hospital/clinic		
2. Traditional		
3. Government health worker		
4. Community health worker		
5. NGO health worker		
6. Other (specify_____)		

Section 4: Economic condition

1. During the past one year, did your family get cash income from selling crops (rice, wheat, vegetables, fruits, jute, etc.)?

1. Yes
2. No (→4)

2. What kind of crops did you sell? ASK QUESTION 2 FOR ALL ITEMS BEFORE GOING TO QUESTION 3		3. How much did you get from selling […]?
Item	1. Yes 2. No	Cash income Tk./year
1. Rice		
2. Wheat		
3. Vegetables		
4. Fruits		
5. Jute		
6. Other		
	Total	

4. During the past one year, did your family get cash income from selling livestock (cows, goats, chickens, etc.)?

1. Yes
2. No (→7)

5. What kind of livestock did you sell? ASK QUESTION 5 FOR ALL ITEMS BEFORE GOING TO QUESTION 6		6. How much did you get from selling […]?
Item	1. Yes 2. No	Cash income Tk./year
1. Cows		
2. Goats		
3. Chickens/ducks		
4. Other		
	Total	

7. During the past one year, did your family get cash income from selling fish?

1. Yes
2. No (→10)

8. Did you sell fish?		9. How much did you get from selling fish?
Item	1. Yes 2. No	Cash income Tk./year
1. Fish		

10. During the past one year, did any member of your household get cash income as a self-employed worker?

1. Yes
2. No (→13)

11. What type of work did they do?
[MULTIPLE ANSWER]

☐1. Professional
☐2. Sales/business
☐3. Service
☐4. Factory
☐5. Transportation/vehicle operation
☐6. Construction
☐7. Other (specify_____)

12. How much did they earn?

☐ Tk./year

13. During the past one year, did any member of your household get cash income as a salaried worker?

1. Yes
2. No (→16)

14. What type of work did they do?
[MULTIPLE ANSWER]

☐1. Professional
☐2. Sales/business
☐3. Service
☐4. Factory
☐5. Transportation/vehicle operation
☐6. Construction
☐7. Other (specify_____)

15. How much did they earn?

☐ Tk./year

16. During the past one year, did any member of your household get cash income from other sources such as land/house rent, gift, remittance, or assistance from others?

1. Yes
2. No (→19)

17. Was it from [...]? ASK QUESTION 17 FOR ALL ITEMS BEFORE GOING TO QUESTION 18		18. How much did you get from […]?
Item	1. Yes 2. No	Cash income Tk./year
1. Land/house rent		
2. Gift		
3. Remittance		
4. Assistance		
5. Other (specify_____)		
	Total	

19. During the past one year, how much did your family spend for the following purposes per month on average? If monthly expenditure is not known, please tell us the annual spending.

Purpose	Tk./month	Tk./year
1. Food		
2. Clothes		
3. Electricity		
4. Fuels/kerosine		
5. School/education		
6. Medical (doctors/medicines)		
7. Transportation		
8. Savings		
9. Other		
	Total	

Section 5: Households' willingness to pay for improved water service

I want to describe to you some of the kinds of improved water services that could be built in [NAME OF MOUZA]. I will then ask you several questions about what water services your household would like if they were available at different prices. It is important that you give us honest answers. If you tell us a lower price than that you can really afford, a system could be designed that you do not really want. On the other hand, if you tell us a higher price than that you can really afford, then a system could be designed that is too expensive to operate. In this case, the system would be likely to fail because the people cannot afford to pay for the operation and maintenance. So please answer these questions as truthfully as you can.

Suppose that a water pipeline were installed in your neighborhood, and that there were several public taps where people like you could go to collect water. A public tap could have one or more water outlets or faucets where people could come to fill their containers.
[SHOW RESPONDENT PICTURES & DIAGRAMS OF PUBLIC TAPS]

I want you to assume that a public water tap would be near your home. No one would have to walk more than 3 minutes to reach one of these public taps; everyone in the neighborhood would have a public tap within 100 meters of their house. Assume that the water was reliable and of good quality, arsenic safe, and that the public taps would be open from 7:00 a.m. in the morning until 7:00 p.m. in the evening.

One way people may decide to pay for water from public taps is for every household that wanted to collect water from the public tap to pay a monthly fee. In this case, there would be a public tap attendant who would check to make sure that everyone that collected water had paid their monthly fee. One advantage of this payment system is that once a household has paid the monthly fee to the attendant, members from the household could collect as much water as they wanted from the public tap for no additional charge.

The money collected would be used to pay for the operation and maintenance of the water system and the salary of the attendant. For example, there will be fuel costs to pump the water and costs of repairing the pipeline and pumping station. Each household would be free to decide for itself whether to purchase water from the public tap or to continue using existing wells of which water was contaminated with arsenic causing serious diseases.

1. What is the maximum amount would you be willing to pay per day to use the public taps? How about per month?
[MAX WTP PER DAY/MONTH FOR PUBLIC TAPS]

_____ Tk./day

_____ Tk./month

2. How long would you spend for safe water?

_____ minutes

Section 6: Community group activity

1. Has your family participated in group efforts to clean up the environment within the past 5 years? (cleanliness)

1. Yes
2. No

2. Has your family participated in group efforts to build or repair infrastructure within the past 5 years?

1. Yes
2. No

3. Has your family participated in a community sponsored health program within the past 5 years?

1. Yes
2. No

4. Has your family ever been involved in community sponsored programs to provide mutual assistance?

1. Yes
2. No

Annex 5.3a Socio-economic Conditions of 16 Mauza

No	Mauza	Union	Ward No.	Area Km2	Population	Household	# of Para	Religion						Literacy Rate		Community Leader
								1ST		2ND		3RD		Male	Female	
1	Ramlhandrapur	Keshabpur	8	1.85641	1,359	305	7	Islam	70%	Hinduism	30%	N/A	N/A	>50%	>50%	Md. Abdul Khalek
2	Byasdanga	Keshabpur	9	1.30074	1,118	249	7	Islam	98%	Hinduism	2%	N/A	N/A	=50%	<50%	Md.Abdul Mazid Morol
3	Brahmakati	Keshabpur	8	1.39360	1,448	303	8	Islam	80%	Hinduism	20%	N/A	N/A	>50%	<50%	Md. Fazlur Rahman Khan
4	Khatiakhali	Keshabpur	9	0.76277	895	207	3	Hinduism	75%	Islam	25%	N/A	N/A	<50%	<50%	Diponkar Chakraborty
5	Maguradanga	Keshabpur	9	1.35247	1,303	316	7	Hinduism	55%	Islam	45%	N/A	N/A	>50%	=50%	Santosh Kumar Das
6	Baliadanga	Keshabpur	7	1.92311	2,907	722	7	Hinduism	67%	Islam	33%	N/A	N/A	=50%	<50%	Subodh Mittra
7	Sujapur	Keshabpur	7	1.64659	1,373	302	4	Hinduism	50%	Islam	50%	N/A	N/A	>50%	>50%	Rafiqul Islam Babul
8	Altapol	Keshabpur	5/6	5.27658	8,702	1,932	25	Islam	73%	Hinduism	25%	Christianity	2%	>50%	>50%	Md. Abdus Samad Biswas
9	Sarfabad	Keshabpur	6	0.83065	519	124	3	Islam	100%	N/A	N/A	N/A	N/A	>80%	>50%	Prof.Md. Akkas Ali
10	Bajitpur	Keshabpur	6	0.69833	1,142	227	5	Islam	80%	Hinduism	20%	N/A	N/A	>50%	<50%	Md. Monjurul Alam
11	Sabdia	Keshabpur	5	1.13873	1,720	347	7	Islam	94%	Hinduism	6%	N/A	N/A	<50%	<20%	Md. Abdul Karim
12	Kesabpur	Keshabpur	3	0.41232	1,512	293	4	Hinduism	65%	Islam	34%	Christianity	1%	>80%	>80%	Md.Mashiar Rahman
13	Madhyakul	Keshabpur	4	3.57885	3,485	767	10	Islam	71%	Hinduism	29%	N/A	N/A	>50%	<50%	Md. Ayub Khan
14	Habaspol	Keshabpur	2	0.84905	1,107	216	3	Islam	100%	N/A	N/A	N/A	N/A	=50%	<50%	Md.Ishaque Uddin Khan
15	Bhagati Narendrapur	Keshabpur	3	3.21208	4,153	868	8	Islam	98%	Hinduism	2%	N/A	N/A	>50%	>50%	Md. Mohsin Ali
16	Rajnagar Bankabarsi	Panjia	7	2.82456	1,941	412	8	Islam	95%	Hinduism	5%	N/A	N/A	>50%	>50%	Md. Golam Mostafa

Annex 5.3a Socio-economic Conditions of 16 Mauza

No	Mauza	Community Activity (Organized meetings held)	Actions Taken for Arsenic Problems					Industry			Agricultural Products		
			Arsenic Survey	Meetings	Committee	Dissemination	GOV/NGO Assistance	1ST	2ND	3RD	1ST	2ND	3RD
1	Ramlhandrapur	Monthly	N/A	N/A	N/A	N/A	N/A	Farming	Business	Transportation	Rice/Irri	Jute	Vegetables
2	Byasdanga	Monthly	N/A	N/A	N/A	N/A	N/A	Farming	Business	Transportation	Rice/Boro	Vegetables	Pulse
3	Brahmakati	Quarterly	*	*	N/A	*	N/A	Other (daily labor)	Business	Transportation	Rice/Irri	Jute	Vegetables
4	Khatiakhali	Semiannually	N/A	N/A	N/A	N/A	*	Farming	Business	Other (service)	Rice/Irri	Rice/Aman	Jute
5	Maguradanga	Quarterly	*	*	N/A	N/A	*	Farming	Other (teaching)	Business	Rice/Irri	Rice/Boro	Pulse
6	Baliadanga	Daily	N/A	*	N/A	N/A	*	Farming	Aquaculture	Other (service)	Rice/Irri	Jute	Pulse
7	Sujapur	Monthly	N/A	*	N/A	N/A	*	Farming	Transportation	Business	Rice/Boro	Pulse	Jute
8	Altapol	Quarterly	*	*	*	*	*	Farming	Other (daily labor)	Business	Rice/Aman	Rice/Irri	Jute
9	Sarfabad	Monthly	N/A	*	N/A	*	*	Farming	Business	Transportation	Rice/Aman	Rice/Irri	Vegetables
10	Bajitpur	Weekly	N/A	N/A	N/A	N/A	*	Farming	Business	Other (service)	Rice/Boro	Rice/Aman	Vegetables
11	Sabdia	Monthly	*	*	*	*	*	Farming	Business	Transportation	Rice/Irri	Rice/Aman	Wheat
12	Kesabpur	Monthly	*	*	N/A	*	*	Business	Other (service)	Farming	Rice/Irri	Rice/Aman	Pulse
13	Madhyakul	Monthly	*	*	N/A	*	*	Farming	Transportation	Business	Rice/Irri	Rice/Aman	Wheat
14	Habaspol	Semiannually	N/A	*	N/A	N/A	*	Farming	Transportation	Business	Rice/Irri	Rice/Aman	Vegetables
15	Bhagati Narendrapur	Monthly	N/A	*	N/A	N/A	*	Farming	Transportation	Business	Rice/Irri	Rice/Aman	Vegetables
16	Rajnagar Bankabarsi	Quarterly	*	*	*	*	*	Farming	Transportation	Aquaculture	Rice/Irri	Wheat	Pulse

Annex 5.3a Socio-economic Conditions of 16 Mauza

No	Mauza	Human Waste Treatment	Solid Waste Treatment	Health Facility (Distance in Km)	Outreach Health Service by GOV	School Facility	
						Primary	Secondary
1	Ramlhandrapur	Private toilets without septic tanks	Dumped on to the yard/in the garden	4.00	Monthly	*	*
2	Byasdanga	In the garden/field	Dumped on to the yard/in the garden	3.00	Fortnightly	*	N/A
3	Brahmakati	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.25	Monthly	*	N/A
4	Khatiakhali	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.00	Daily	N/A	N/A
5	Maguradanga	Private toilets without septic tanks	Dumped on to the yard/in the garden	3.00	Weekly	*	N/A
6	Baliadanga	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.00	Semiannually	*	*
7	Sujapur	In the garden/field	Dumped on to the yard/in the garden	3.00	Weekly	*	N/A
8	Altapol	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.50	Weekly	*	*
9	Sarfabad	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.00	Monthly	*	N/A
10	Bajitpur	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.00	Monthly	*	N/A
11	Sabdia	Private toilets without septic tanks	Dumped on to the yard/in the garden	1.00	Fortnightly	*	N/A
12	Kesabpur	Private toilets with septic tanks	Dumped on to the yard/in the garden	0.25	Monthly	*	*
13	Madhyakul	Private toilets without septic tanks	Dumped on to the yard/in the garden	2.00	Fortnightly	*	N/A
14	Habaspol	In the garden/field	Dumped on to the yard/in the garden	1.50	Monthly	N/A	N/A
15	Bhagati Narendrapur	Private toilets without septic tanks	Dumped on to the yard/in the garden	1.25	Monthly	*	N/A
16	Rajnagar Bankabarsi	Private toilets without septic tanks	Picked up by garbage collection service	5.00	Monthly	*	*

Annex 5.3b Socio-economic Conditions of 16 Mouzas

1. Ramlhandrapur

The Mouza occupies an area of 1.85641 km^2. The Mouza is bounded on the east by Byasdanga, on the south by Brahmakati and on the west by Madhyakul. The Mouza has a population of 1,359. 70 % of the residents are Muslims. The remaining 30 % are Hindus. The literacy rate (of residents 15 years and over) is over 50 % for both sexes. Organized community meetings are held monthly. No action against arsenic problems is taken. Farming is the most important industry, followed by business and transportation. Rice/Irri is the main agricultural product, followed by jute and vegetables. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 4 km. The outreach health service by the government is provided monthly. There are both primary and secondary schools in the Mouza.

2. Byasdanga

The Mouza occupies an area of 1.30074 km^2. The Mouza is bounded on the south by Maguradanga, Khatiakhali and Brahmakati and on the west by Ramlhandrapur. The Mouza has a population of 1,118. 98 % of the residents are Muslims. The remaining 2 % are Hindus. The literacy rate (15 years and over) is 50 % for males and less than 50% for females. Organized community meetings are held monthly. No action against arsenic problems is taken. Farming is the most important industry, followed by business and transportation. Rice/Boro is the main agricultural product, followed by vegetables and pulse. Human waste is treated in the garden/field. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 3 km. The outreach health service by the government is provided fortnightly. There are primary schools in the Mouza.

3. Brahmakati

The Mouza occupies an area of 1.39360 km^2. The Mouza is bounded on the north by Ramlhandrapur, on the east by Byasdanga and Khatiakhali, on the south by Baliadanga and on the west by Madhyakul. The Mouza has a population of 1,448. 80 % of the residents are Muslims. The remaining 20 % are Hindus. The literacy rate (15 years and over) is over 50 % for males and less than 50 % for females. Organized community meetings are held quarterly. Actions against arsenic problems are taken (survey, meetings and dissemination). Daily labor such as farming and service is the most important industry, followed by business and transportation. Rice/Irri is the main agricultural product, followed by jute and vegetables. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2.25 km. The

outreach health service by the government is provided monthly. There are primary schools in the Mouza.

4. Khatiakhali

The Mouza occupies an area of 0.76277 km^2. The Mouza is bounded on the north by Byasdanga, on the east by Maguradanga, on the south by Baliadanga and on the west by Brahmakati. The Mouza has a population of 895. 75 % of the residents are Muslims. The remaining 25 % are Hindus. The literacy rate (15 years and over) is less than 50 % for both sexes. Organized community meetings are held semiannually. Action against arsenic problems is taken (request for government and NGOs' assistance). Farming is the most important industry, followed by business and service. Rice/Irri is the main agricultural product, followed by rice/Aman and jute. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2 km. The outreach health service by the government is provided daily. There are no primary or secondary schools in the Mouza.

5. Maguradanga

The Mouza occupies an area of 1.35247 km^2. The Mouza is bounded on the east by Rajnagar Bankabarsi, on the south by Sujapur and on the west by Baliadanga and Khatiakhali. The Mouza has a population of 1,303. 55 % of the residents are Hindus. The remaining 45 % are Muslims. The literacy rate (15 years and over) is over 50 % for males and 50 % for females. Organized community meetings are held quarterly. Actions against arsenic problems are taken (survey, meetings and request for government and NGOs' assistance). Farming is the most important industry, followed by business. Rice/Irri is the main agricultural product, followed by rice/Boro and pulse. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 3 km. The outreach health service by the government is provided weekly. There are primary schools in the Mouza.

6. Baliadanga

The Mouza occupies an area of 1.92311 km^2. The Mouza is bounded on the north by Brahmakati, Khatiakhali, on the east by Maguradanga and Sujapur, on the south by Altapol and on the west by Madhyakul and Kesabpur. The Mouza has a population of 2,907. 67 % of the residents are Muslims. The remaining 33 % are Hindus. The literacy rate (15 years and over) is 50 % for males and less than 50 % for females. Organized community meetings are held daily. Actions against arsenic problems are taken (meetings and request for government and NGOs' assistance). Farming is the most important industry, followed by aquaculture and

service. Rice/Irri is the main agricultural product, followed by jute and pulse. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2 km. The outreach health service by the government is provided semiannually. There are both primary and secondary schools in the Mouza.

7. Sujapur

The Mouza occupies an area of 1.64659 km^2. The Mouza is bounded on the north by Maguradanga and Rajnagar Bankabarsi, on the south by Altapol and on the west by Baliadanga. The Mouza has a population of 1,373. 50 % of the residents are Hindus. The remaining 50 % are Muslims. The literacy rate (15 years and over) is over 50 % for both sexes. Organized community meetings are held monthly. Actions against arsenic problems are taken (meetings and request for government and NGOs' assistance). Farming is the most important industry, followed by transportation and business. Rice/Boro is the main agricultural product, followed by pulse and jute. Human waste is treated in the garden/field. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 3 km. The outreach health service by the government is provided weekly. There are primary schools in the Mouza.

8. Altapol

The Mouza occupies an area of 5.27658 km2. The Mouza is bounded on the north by Kesabpur, Baliadanga and Sujapur and on the west by Sabdia, Bajitpur and Sarfabad. The Mouza has a population of 8,702. 73 % of the residents are Muslims. The remaining 25 % and 2 % are Hindus and Christians respectively. The literacy rate (15 years and over) is over 50 % for both sexes. Organized community meetings are held quarterly. Actions against arsenic problems are taken (survey, meetings, committee, dissemination and request for government and NGOs' assistance). Farming is the most important industry, followed by business. Rice/Aman is the main agricultural product, followed by rice/Irri and jute. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2.5 km. The outreach health service by the government is provided weekly. There are both primary and secondary schools in the Mouza.

9. Sarfabad

The Mouza occupies an area of 0.83065 km^2. The Mouza is bounded on the north by Bajitpur, on the north and the east by Altapol. The Mouza has a population of 519. All residents are Muslims. The literacy rate (15 years and over) is over 80 % for males and over 50 % for

females. Organized community meetings are held monthly. Actions against arsenic problems are taken (meetings, dissemination and request for government and NGOs' assistance). Farming is the most important industry, followed by business and transportation. Rice/Aman is the main agricultural product, followed by rice/Irri and vegetables. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2 km. The outreach health service by the government is provided monthly. There are primary schools in the Mouza.

10. Bajitpur

The Mouza occupies an area of 0.69833 km^2. The Mouza is bounded on the north and the east by Altapol, on the south by Sarfabad and on the west by Sabdia. The Mouza has a population of 1,142. 80 % of the residents are Muslims. The remaining 20 % are Hindus. The literacy rate (15 years and over) is over 50 % for males and less than 50 % for females. Organized community meetings are held weekly. Action against arsenic problems is taken (request for government and NGOs' assistance). Farming is the most important industry, followed by business and service. Rice/Boro is the main agricultural product, followed by rice/Aman and vegetables. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2 km. The outreach health service by the government is provided monthly. There are primary schools in the Mouza.

11. Sabdia

The Mouza occupies an area of 1.13873 km^2. The Mouza is bounded on the east by Altapol and on the west by Bhagati Narendrapur. The Mouza has a population of 1,720. 94 % of the residents are Muslims. The remaining 6 % are Hindus. The literacy rate (15 years and over) is less than 50 % for males and less than 20 % for females. Organized community meetings are held monthly. Actions against arsenic problems are taken (survey, meetings, committee, dissemination and request for government and NGOs' assistance). Farming is the most important industry, followed by business and transportation. Rice/Irri is the main agricultural product, followed by rice/Aman and wheat. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 1 km. The outreach health service by the government is provided fortnightly. There are primary schools in the Mouza.

12. Kesabpur

The Mouza occupies an area of 0.41232 km^2. The Mouza is bounded on the north and the east by Madhyakul, on the east by Baliadanga, on the south by Altapol and on the west by Bhagati

Narendrapur. The Mouza has a population of 1,512. 65 % of the residents are Hindus. The remaining 34 % and 1 % are Hindus and Christians respectively. The literacy rate (15 years and over) is over 80 % for both sexes. Organized community meetings are held monthly. Actions against arsenic problems are taken (survey, meetings, dissemination and request for government and NGOs' assistance). Business is the most important industry, followed by service and farming. Rice/Irri is the main agricultural product, followed by rice/Aman and pulse. Human waste is treated with private toilets with septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 0.25 km. The outreach health service by the government is provided monthly. There are both primary and secondary schools in the Mouza.

13. Madhyakul

The Mouza occupies an area of 3.57885 km^2. The Mouza is bounded on the east by Ramlhandrapur and Brahmakati, on the south by Baliadanga and Kesabpur and on the west by Habaspol and Bhagati Narendrapur. The Mouza has a population of 3,485. 71 % of the residents are Muslims. The remaining 29 % are Hindus. The literacy rate (15 years and over) is over 50 % for males and less than 50 % for females. Organized community meetings are held monthly. Actions against arsenic problems are taken (survey, meetings, dissemination and request for government and NGOs' assistance). Farming is the most important industry, followed by transportation and business. Rice/Irri is the main agricultural product, followed by rice/Aman and wheat. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 2 km. The outreach health service by the government is provided fortnightly. There are primary schools in the Mouza.

14. Habaspol

The Mouza occupies an area of 0.84905 km^2. The Mouza is bounded on the east by Madhyakul and on the south by Bhagati Narendrapur. The Mouza has a population of 1,107. All residents are Muslims. The literacy rate (15 years and over) is 50 % for males and less than 50 % for females. Organized community meetings are held semiannually. Actions against arsenic problems are taken (meetings and request for government and NGOs' assistance). Farming is the most important industry, followed by transportation and business. Rice/Irri is the main agricultural product, followed by rice/Aman and vegetables. Human waste is treated in the garden/field. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 1.5 km. The outreach health service by the government is provided monthly. There are no primary or secondary schools in the Mouza.

15. Bhagati Narendrapur

The Mouza occupies an area of 3.21208 km^2. The Mouza is bounded on the north by Habaspol and on the east by Madhyakul and Kesabpur. The Mouza has a population of 4,153. 98 % of the residents are Muslims. The remaining 2 % are Hindus. The literacy rate (15 years and over) is over 50 % for both sexes. Organized community meetings are held monthly. Actions against arsenic problems are taken (meetings and request for government and NGOs' assistance). Farming is the most important industry, followed by transportation and business. Rice/Irri is the main agricultural product, followed by rice/Aman and vegetables. Human waste is treated with private toilets without septic tanks. Solid waste is dumped in the yard and in the garden. The nearest health facility from the Mouza is within 1.25 km. The outreach health service by the government is provided monthly. There are primary schools in the Mouza.

16. Rajnagar Bankabarsi

The Mouza occupies an area of 2.82456 km^2. The Mouza is bounded on the south by Sujapur and on the west by Maguradanga. The Mouza has a population of 1,941. 95 % of the residents are Muslims. The remaining 5 % are Hindus. The literacy rate (15 years and over) is over 50 % for both sexes. Organized community meetings are held quarterly. Actions against arsenic problems are taken (survey, meetings, committee, dissemination and request for government and NGOs' assistance). Farming is the most important industry, followed by transportation and aquaculture. Rice/Irri is the main agricultural product, followed by wheat and pulse. Human waste is treated with private toilets without septic tanks. Solid waste is picked up by the garbage collection service. The nearest health facility from the Mouza is within 5 km. The outreach health service by the government is provided monthly. There are both primary and secondary schools in the Mouza.

Annex 5.4 Results of the Medical Examination of Arsenic Patients

Mouza	Age	Sex	Symptom	Others	Remarks
Bysdanga	55	Male	Melanosis: Chest ++, Back +	-	-
Bysdanga	38	Male	Melanosis: Chest ++, Back + Keratosis: Palm +, Sole +	-	-
Bysdanga	35	Male	Melanosis: Chest ++, Back ++, Hand +, Palm + (Diffuse Melanosis)	Buergers	Lost 3 fingers
Bysdanga	35	Female	Melanosis: Chest ++	-	-
Bysdanga	15	Female	Melanosis: Chest ++, Back ++ Keratosis: Palm +, Sole + Leucomelanosis: Chest +	-	-
Brahmakati	60	Male	Melanosis: Chest +	-	-
Brahmakati	54	Male	Melanosis: Chest+, Back +, Hand +	-	
Brahmakati	37	Male	Melanosis: Chest ++, Back ++, Hand + Keratosis: Palm +, Sole +	-	-
Maguradanga	82	Male	Melanosis: Chest ++	Buergers	Lost his toe
Maguradanga	55	Male	Melanosis: Chest +	-	-
Maguradanga	45	Male	Melanosis: Chest ++, Back +, Hand + Keratosis: Palm +, Sole + Leucomelanosis: Chest +	Buergers	Lost one figure
Maguradanga	32	Male	Melanosis: Chest +	-	-
Maguradanga	28	Male	Melanosis: Chest ++	-	-

*++Moderate, +Mild

**Medical diagnosis by Dr.M.H.Faruquee, Asia Arsenic Network (March 2, 2002)

CHAPTER 6

CURRENT STATE AND PROBLEM OF PROJECT TARGET AREA

Supporting Report 2

CHAPTER 6 CURRENT STATE AND PROBLEM OF PROJECT TARGET AREA

6.1 Institutional Framework

6.1.1 Central Level Stakeholders Involved in the Water Supply and Sanitation Sector

1) Lead Ministries and Institutions:

A. The Ministry of Local Government, Rural Development and Co-operatives

This Ministry has two broad divisions, one is the Local Government Division and the other is the Rural Development and Co-Operatives Division. The functions of the respective divisions are as follows:

Local Government Division

One of the main functions of this division is the financing, regulation and inspection of the authorities established for local government and village administration, which includes the rural police. The activity of the Department of Public Health Engineering (DPHE) comes under this division, because the water supply and sanitation of the Pourashava and rural areas except Dhaka and Chittagong City are dealt with by DPHE. Besides the above mentioned functions, matters related to burial grounds, cremation grounds, prevention of cattle trespass, public parks, arboriculture gardens, administration of Bangladesh Civil Service (BCS) (Public Health Engineering), control of hotels and restaurants and liaison with International Organizations and world bodies are also dealt with by this division.

Rural Development and Co-Operatives Division

Preparation of schemes and implementation of policies in the following sectors:

Rural development, co-operative society, agricultural credit, co-operative banking / marketing / training, small-scale industries, debt settlement, relief of indebtedness, and integrated Rural Development Program (RDP).

Besides the above-mentioned functions, matters related to the administration of B.C.S (Co-operative), training, education, liaison with international organizations and other world bodies and laws, administration etc. pertain to this division.

B Ministry Of Health And Family Welfare

The main functions of this Ministry are to formulate policy regarding health, family planning, international aspects of medical facilities and public health, sanitation, regulations, education, training, research, standardization, manufacturing of biological and pharmaceutical products,

import/export of drugs, medical and health services (promotive, preventive, curative, and rehabilitative), national/international medical association and matters relating to public health, hospitals/dispensaries. Besides the above mentioned activities the control of drugs, homeopathic/indigenous system of medicine, malaria/ other diseases and sanitation of hospitals and dispensaries are also looked after by the ministry. Standardization and quality control of food, water and other health related commodities. Administration of maternity and child health centers, B.C.S (Health), B.C.S (Family planning), morgues, secretariat including financial maters and laws related to the ministry.

C Ministry Of Environment And Forest

The ministry deals primarily with the environment, ecology and environmental pollution control. The environment covers the conservation and development of the forest resources of the country including research and training in forestry. Protection of wild birds, animals and the establishment of sanctuaries. Administration of B.C.S (Forest), liaison with international organizations / world bodies and all laws on subjects related to this ministry.

The MoEF is the key government institution in Bangladesh for all matters relating to national environmental policy and regulatory issues. The MoEF oversees the activities of the following technical / implementing agencies.

- Department of Environment (DoE)
- Department of Forest (DoF)
- Bangladesh Forest Industries Development Corporation (BFIDC)
- Bangladesh Forest Research Institute (BFRI) and Institute of Forestry
- Forestry Division of the Bangladesh Agricultural Research Council (BARC) and
- National Herbarium.

D. Ministry Of Water Resources

The main functions of this ministry are regulation, development of rivers / river valleys including general policy / technical assistance in the field of irrigation, flood control, anti water logging, drainage and anti erosion. All matters relating to irrigation flood control, causes of floods, assessment of damage and protection. Activities like research on rivers/ river valleys, flood control works, international commissions / conferences relating to irrigation / flooding. All works related to the construction of reservoirs, embankment, land reclamation, estuary control, soil conservation, drainage and water logging, Hydrological survey/ data collection. Liaison with international organization / world bodies and matters relating to various joint committees (National / International), and all laws on subjects to the Ministry.

2) Department of Public Health Engineering (DPHE)

The Department of Public Health Engineering (DPHE) is a Government organization under the Ministry of Local Government, Rural Development and Co-operatives. This organization has been working in the field of water supply and sanitation since 1963. DPHE is responsible for providing safe drinking water supply, sanitation and drainage systems throughout Bangladesh except Dhaka, Narayanganj and Chittagong. DPHE is contributing to the infrastructural development related to the establishment of water supply systems such as water treatment plants, overhead water tanks, etc. This organization is also solely involved in the technical maintenance of this infrastructure.

According to the National Policy of Safe Water Supply and Sanitation 1998, the Department of Public Health Engineering (DPHE) has been entrusted with the responsibility of developing facilities for safe water supply and sanitation in the urban areas of the whole country. Only three out of 64 districts, namely Dhaka, Narayanganj and Chittagong have separate authorities for urban water supply management.

In the remaining 61 urban areas the DPHE is responsible for designing, planning and constructing water supply systems including development of the source and construction for reticulation and storage facilities.

The source of supply is either groundwater and/or surface water. After construction of the facilities by the DPHE these are handed over to the urban authorities or municipalities for operation and maintenance of the system.

There is no sewerage system in these district towns where septic tanks or bucket systems are being used and the untreated effluent is discharged to the nearby water course/low lying area. DPHE has not yet been able to extend the services to include sewerage treatment but is limited to providing only the sanitation facilities.

The functions of DPHE can be stipulated as follows.

- Enhancement of coverage by ensuring a safe drinking water supply, sanitation, and drainage and waste management in the Pourashavas / Municipalities of Bangladesh.
- Incorporation of local agencies to the development activities.
- Reduction of imbalance of coverage among municipalities by providing more deep tube wells in those areas, which have comparatively less coverage.
- Augmentation of sanitary latrine coverage either by the Government or by promoting non-government agencies.
- Providing the necessary technical support as and when required regarding water supply and sanitation.
- Enhancement of public awareness regarding reduction of wastage of water.
- Involving and encouraging the public sector.
- Strengthening the capacity of local bodies, DPHE and other stakeholders.

- Encouraging women's participation in sector activities.
- Strengthening co-ordination between DPHE and other contributors of the sector.
- DPHE to act as lead agency.

Organization and staffing

DPHE is mandated as the lead agency of the Government for implementation of the water supply and sanitation program. The Chief Engineer is the main executive of this organization. Two additional chief engineers and ten superintending engineers support the main executive of this organization.

The present organogram of DPHE is shown in Figure 6.1.

Department of Public Health Engineering

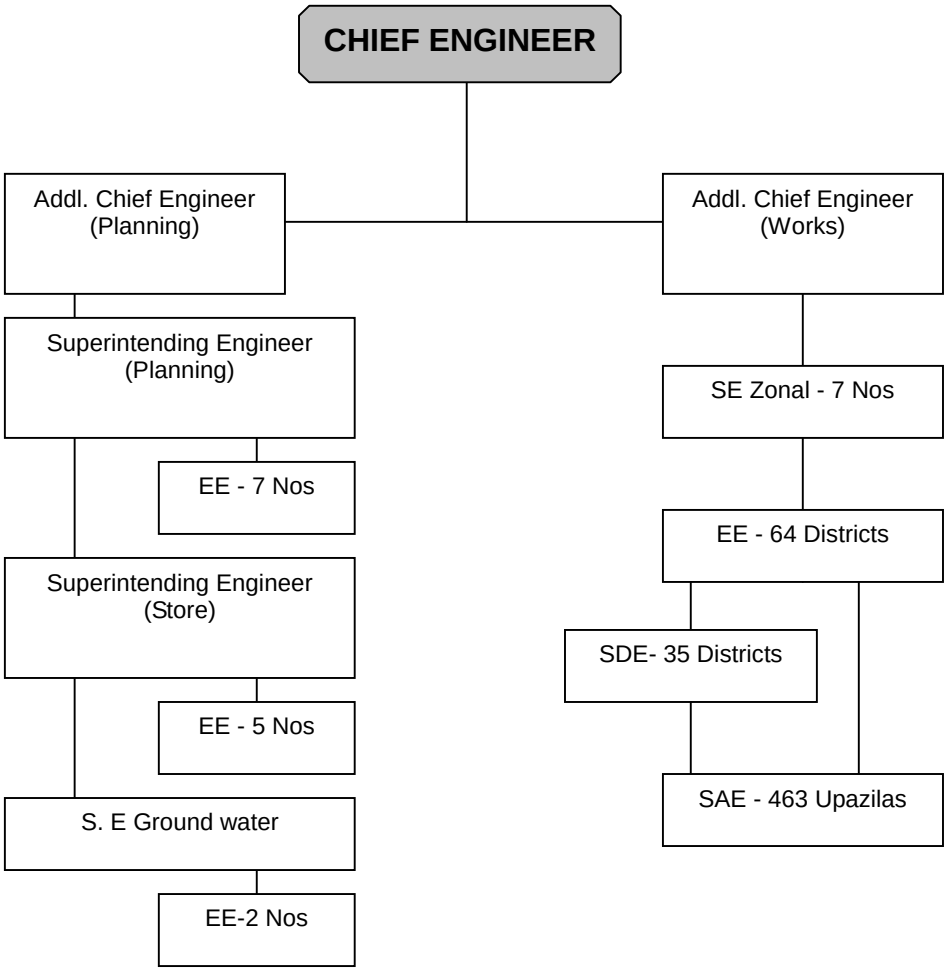


Figure 6.1 Organogram of DPHE

DPHE has organized numerous programs and activities. Among them, the on-going programs and activities are as follows.

1. Water Supply Project in Rajshai Metropolitan City
2. Water Supply Project in 23 towns.
3. Water Supply Project at Coastal Area - First Phase.
4. Rural Sanitation Project.
5. Sanitation, Health Improvement and Water Supply Project in Rural Areas
6. Environmental Sanitation, Health Care and Water Supply Project in Pouro Slum and Urban Area.
7. Water Supply and Sanitation Project at Gopalganj Pouroshavas and Thanas.
8. Tube Well Regeneration in Pouroshavas along with Development of Water Supply System Including Rehabilitation.
9. Water Supply and Sanitation System Accelerated Development Project in Hill Tracts Districts.
10. GOB-DANIDA Rural Water Supply and Sanitation Project at Coastal Area.
11. Water Supply and Sanitation Project in Bhairab Pouroshava.
12. Water Supply Through Pipeline and Sanitation at Gouronadi and Kalkini Pouroshava
13. GOB –DANIDA Arsenic Mitigation Project
14. Study on Ground Water Development of Deep Aquifer for Safe Drinking Water Supply to Arsenic-affected Areas in Western Bangladesh.
15. Char Development and Settlement Project-2

3) Water and Sewerage Authority, WASA

According to the Gazette notification of October 16, 1963, EP ordinance No XIX of 1963 states "To provide for construction, improvement, expansion, operation and maintenance of water and sewerage works and other facilities relating to environmental sanitation and for construction of authorities therefor". By dint of the ordinance, Dhaka Water Supply and Sewerage Authority (DWASA) and Chittagong Water Supply and Sewerage Authority (CWASA) were created in November 1963. Since the inception of DWASA the main purpose was to supply potable water and ensure the safe removal of sewage. Afterwards, the drainage system is also transferred to DWASA. At present, DWASA is controlled and administered as an autonomous organization according to the amendment of DWASA act in 1996. The main purposes of DWASA are as follows:

- Construction, operation, development and maintenance of a distribution system, reservoirs and other necessary infrastructure (Deep tube wells, water treatment plants, etc.) in order to supply potable water to the people, industries and commercial organizations.

- Construction, development and maintenance of sewerage system and sewage treatment plant.
- Construction, development and maintenance of a storm water sewerage system in order to remove water logging in the Metropolitan City.

Water Operation and Revenue

Dhaka WASA is presently producing approximately 1.2 million m^3 (264 IMGD) of water through 353 deep tube wells and 3 surface water treatment plants. Narayanganj town is included under the Dhaka WASA service area. The length of the distribution network is approximately 2,128 km, providing 191,000 water connections to the consumer (as of June 30, 2001). Besides the authorized connections, DWASA is supplying water to the public through 1643 public standpipes and 966 religious institutions free of cost. The bulk of the supply is met through deep wells, which are approximately 96.64% of the total supply, and the remaining 3.36% from surface water treatment plants.

As per monthly report of November 2001 the following is the financial status.

Item	Unit	Previous month	Month under report (Nov.1)
Billing	Lakh Tk	1,184.35	1255.50
Collection	Lakh Tk	796.53	977.79
Receivables	Lakh Tk	12540.99	12,818.70
Receivables equivalent to months billing	Nos	10.60	10.73
Income	Lakh Tk	862.80	1053.37
Expenditure	Lakh Tk	1674.95	1329.87
Balance	Lakh Tk	-812.15	-276.50

Sewerage and Drainage Components

In regards to the sewerage system, there has not been much development work and as a result only 25 to 30% of the population of the capital city have the benefit of a water borne sewerage facility. In comparison with the 193,000 water connections, there exist only 47,000-sewer connections having a network of only 630 km. The treatment plant (stabilization pond) operates at Pagla with a designed treatment capacity of 120,000 m^3/day. During the dry and wet season, 45,000 m^3/day and 60,000 m^3/day respectively are received at the treatment plant. When compared to water production, 70% of the water (approximately 850,000 m^3) is discharged into the environment as spent water, which is one of the major sources of environmental pollution of the capital city.

Drainage

The drainage system was operated and developed by DPHE since 1947 and then by dint of the ordinance all the assets and liabilities of the drainage function were taken over by DWASA

during March 1989. Further development work was carried out by DWASA under the Project Dhaka Integrated Flood Protection, funded by ADB and GOB. The projects are completed and at present the drainage infrastructure contains 185 km of drainage networks and 3 storm water lift pump stations; DWASA is responsible for the operation and maintenance of the system.

Organization and Staffing

DWASA is headed by a Managing Director and supported by three Deputy Managing Directors. The organizational structure of DWASA is divided into three departments, viz. administration, engineering, and finance and commerce. At present, DWASA has 3,184 officers and supporting staff members. The organogram of DWASA is given in Figure 6.2.

DHAKA WATER AND SEWERAGE AUTHORITY

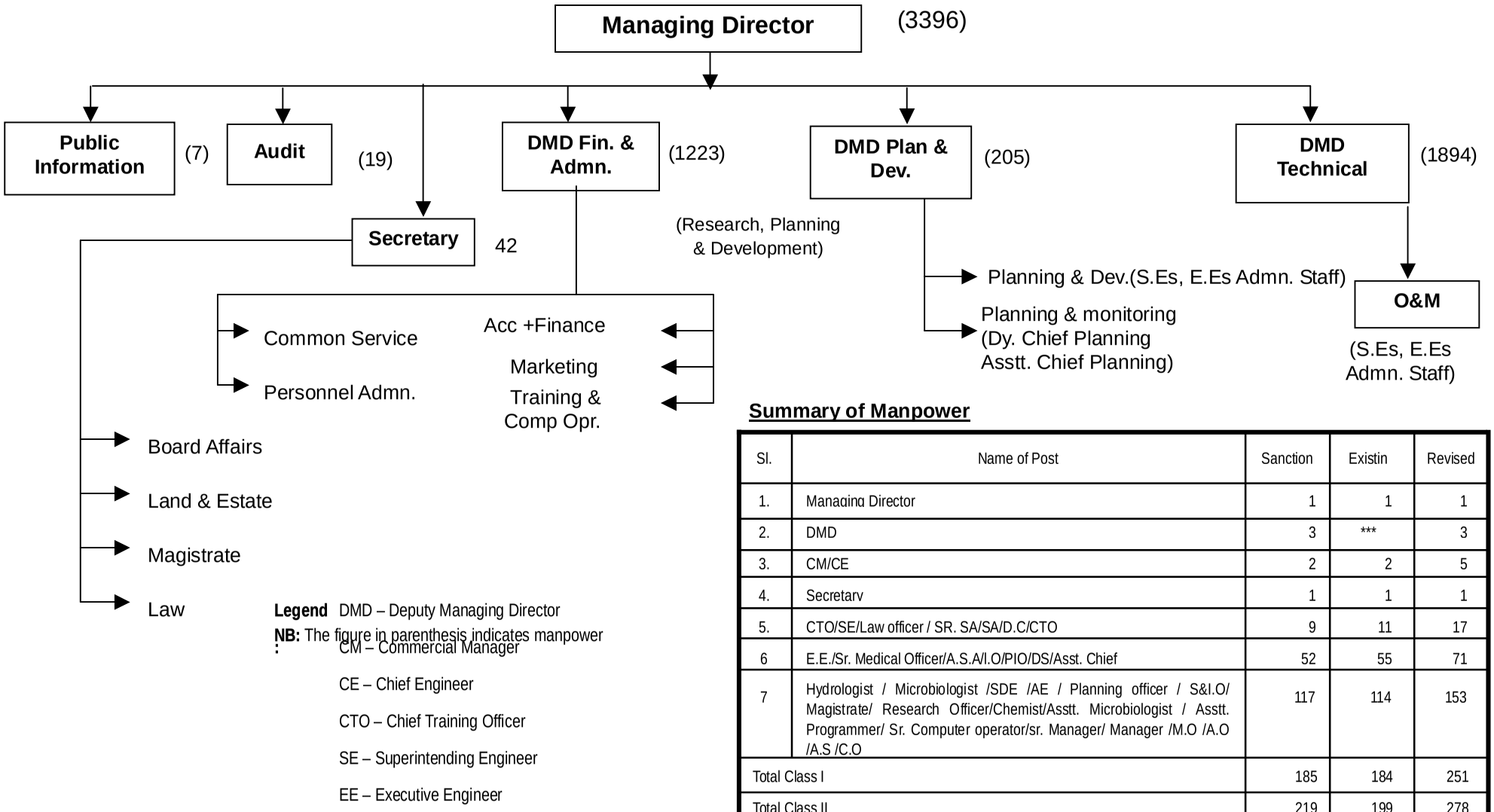


Figure 6.2 Organogram of DWASA

Summary of Manpower

Sl.	Name of Post	Sanction	Existin	Revised
1.	Managing Director	1	1	1
2.	DMD	3	***	3
3.	CM/CE	2	2	5
4.	Secretary	1	1	1
5.	CTO/SE/Law officer / SR. SA/SA/D.C/CTO	9	11	17
6	E.E./Sr. Medical Officer/A.S.A/I.O/PIO/DS/Asst. Chief	52	55	71
7	Hydrologist / Microbiologist /SDE /AE / Planning officer / S&I.O/ Magistrate/ Research Officer/Chemist/Asstt. Microbiologist / Asstt. Programmer/ Sr. Computer operator/sr. Manager/ Manager /M.O /A.O /A.S /C.O	117	114	153
Total Class I		185	184	251
Total Class II		219	199	278
Total Class III		1313	1459	1785
Total Class IV		1158	1342	1082
Grand Total		2875	3184	3396

Development Works of DWASA

At present DWASA has six major projects under implementation under the Annual Development Program of 2001 to 2002. A summary of the projects is given below.

Name of Project	Financing category	Scheme provision	Cumulative expenditure	Source of fund
4th Dhaka w/s Project	LC			GOB
	FE			IDA
	RPA			FRANCE
		75,043	47,597	
Sewerage Const. Rehab. Project	LC	7,809	1,465	GOB
3rd interim w/s project	LC	5,240	4,894	GOB
W/s and sewerage Const. of BICC	LC	968	370	GOB
4th interim w/s project	LC	10,832	8,168	GOB
Water regulating pond kallyanpur (Drainage)	LC	8,266	0	GOB

LC – Local Currency, FE - Foreign Exchange, RPA – Reimbursable Project Aid

4) Local Government Engineering Department (LGED)

The institutional background of LGED can be traced back to the early sixties, when implementation of the three elements of Comilla Model i.e. Rural Works Program (RWP), Thana Irrigation Program (TIP) and Thana Training & Development Center (TTDC) was started. These three elements known as Works Programs continued until 1982 with two branches as the Rural Works Program and Urban Works Program. A "Cell" was established under the Local Government Division (LGD) in 1970s. To administer the Rural Works Programs (RWP) nationwide, the Works Program Wing (WPW) was created in 1982 borne by the Development Budget under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development & Co-operatives (MLGRD &C). It was converted into the Local Government Engineering Bureau (LGEB) under the Government Revenue Budget in October 1984. LGEB was upgraded as the Local Government Engineering Department (LGED) in August 1982. LGED is now one of the prime engineering organizations actively participating in the development efforts of Bangladesh.

The major functions of LGED include the following:

- Provide technical support to the rural Local Government Institutions (LGIs)
- Provide technical support to the urban LGIs
- Planning, implementation, maintenance and monitoring of infrastructure development projects in the rural and urban area.
- Prepare plans, reports, maps, databases, design manuals, technical standards and specifications
- Impart training to LGED officials and the LGI representative

Organization and Staffing

LGED is headed by the Chief Engineer, supported by 2 Addl.C.Es, 6 Superintending Engineers, 6 Executive Engineers and 6 Assistant Engineers at the HQ level and 6 superintending engineers at the divisional level, 64 executive engineers at the district level and 463 Upazila engineers at the Upazila level. The total number of engineers and other staff under the permanent establishment of LGED is 9,600. The organogram of LGDE is presented in Figure 6.3.

Local Government Engineering Department (LGED)

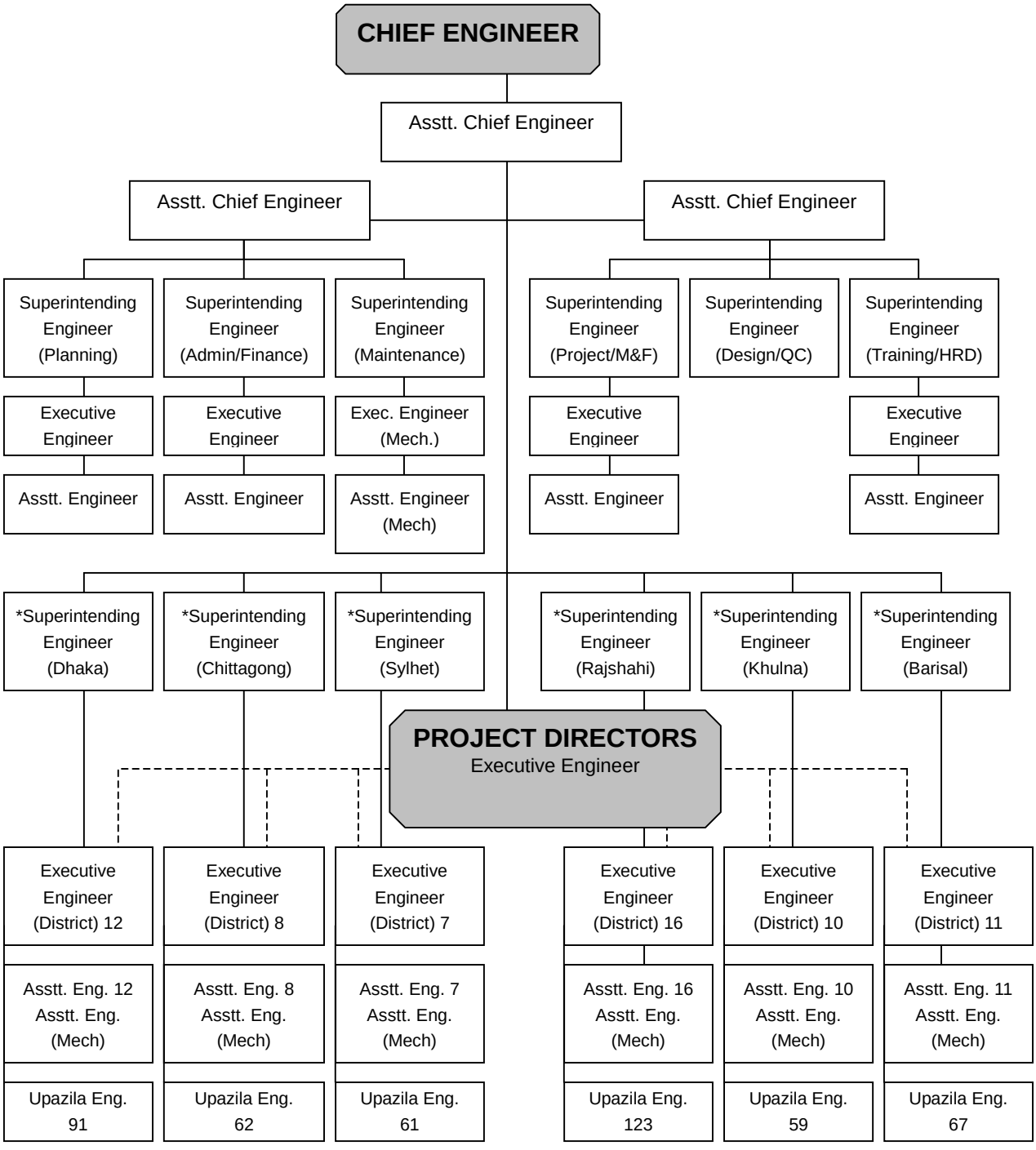


Figure 6.3 Organogram of LGED

The LGED's primary role is rural development programs as well as some urban development projects. The objectives of the rural development and institutions (RD&I) sector during the 5th five-year plan (1997 to 2002) are as follows:

- Reduction of poverty in the rural areas
- Productive employment generation in the rural areas
- Self employment creation for the rural poor
- Development of rural infrastructure
- Development of small and landless farmers

A projection of RD & I is given in the following table:

Program		unit	Projection
Productive employment generation		Million person	1.3
Employment under infrastructure project		Mp/day	175
Growth center development		Number	600
Feeder Road category "B"		Km	7,000
Rural road		Km	15,000
Bridges and culverts		Meter	100,000
Small Scale water related infrastructure	Embankment	Km	1,000
	Khal/canal	Km	4,000
	Water control Str.	Number	350
Maintenance of Physical structure		Km	10,000

LGED is currently responsible for implementation of 36 Rural Development Projects involving a total cost of 67,850 million Taka (US$1,305 million) under the RD & I sector. The allocation under the ADP 2000 to 2001 for this project is 14,531 million Taka (US$280). Out of the 36 RID Projects, 3 are being implemented with food assistance. The total value of food allocation is 1,314 million Taka (US$25), which is about 9% of the total allocation under the ADP during 2000 to 2001.

Urban Infrastructure Development (UID) Projects

Eight Urban Infrastructure Development Projects (UIDP) are presently being implemented by LGED under the physical planning, water supply and housing sector involving a total cost of 16,085 million Taka (US$309 million). The allocation under ADP during the 2000 to 2001 rural projects is 2,083 million Taka (US$40 million). The list of the projects is as follows:

Name of the projects	Project period	Total project cost	ADP allocation (2000-2001)		
			Total	Project aid (GOB contribution)	Development partner
Secondary Towns Infrastructure Development Project-2 (Revised)	1995-2001	3,640.00	750.00	550.00 (200.00)	ADB
Urban Basic Service Delivery Projects	1995-2001	338.28	75.36	30.00 (45.36)	UNICEF
Municipal Services Project	1998-2004	6,751.80	700.00	600.00 (100.00)	IDA
Third Urban Development Project	1998-2004	3,020.00	10.50	10.00 (0.50)	ADB
Rehabilitation Project for Flood Affected Urban Infrastructure	1998-2001	558.00	70.00	60.00 (10.00)	ADB
Urban Poverty Alleviation through local Participation	1998-2003	997.10	307.40	300.00 (7.40)	UNDP
Construction of Flyover at Khilgaon in Dhaka City	1999-2002	740.00	150.00	------- (150.00)	
Construction of Mujib NagarComplex Bhaban (LGED Component)	1999-2002	40.00	20.00	------- (20.00)	
Total		16,085.18	2,083.26	1,550.00 (533.26)	

Unit: Million Taka

5) Department of Environment (DoE)

The DOE was set up in 1989 under the administrative control of the MOEF, and is the executing agency for the planning and implementing of all environmental issues, including, but not limited to, the following activities.

- Reviewing environmental impact assessments and issuing of environmental clearance where applicable.
- Implementing environmental monitoring programs including ambient environment monitoring and enforcement measures.
- Developing and housing environmental databases.
- Promoting environmental awareness through public information programs.
- Coordinating international events in close cooperation with MOEF (e.g. representing Bangladesh in international seminars, workshops etc.)
- Assisting MOEF and other government agencies on environmental technical issues.
- Ensuring growth without compromising the state of the environment
- Controlling, monitoring and mitigating pollution of the environment;
- Providing environmental clearance for proposed industrial projects
- Providing guidance and advice to project proponents

The DoE has at present a total of 173 staff members, headed by a Director General (DG) who is supported by a team of Directors, Deputy Directors, Assistant Directors, Research Officers and other technical staff (e.g. chemists and laboratory technicians). The DoE has four regional offices and 30 monitoring stations.

6.2 NATIONAL RURAL WATER SUPPLY STRATEGY

6.2.1 National Policy Objectives

A national policy for water supply and sanitation was framed in 1998 by the Government of Bangladesh. The broad objectives of the policy are to improve the standard of public health and to ensure an improved environment.

The specific goals are within the overall objectives and the following specific goals will be targeted for achievement in phases in the near future:

(1) Increasing the present coverage of safe drinking water in rural areas by lowering the average number of users per tube well from the present 105 to 50 in the near future.
(2) Ensuring the installation of one sanitary latrine in each household in the rural areas and improving public health standard through inculcating the habit of proper use of sanitary latrines.
(3) Making safe drinking water available to each household in the urban areas.
(4) Ensuring sanitary latrine within easy access of every urban household through technology options ranging from pit latrines to water borne sewerage.
(5) Installing public latrines in schools, bus stations and important public places and community latrines in densely populated poor communities without sufficient space for individual household latrines.
(6) Ensuring supply of quality water through observance of accepted quality standards
(7) Removal of arsenic from drinking water and supply of arsenic free water from alternate sources in arsenic affected areas.
(8) Taking measures in urban areas for removal of solid and liquid waste and their use in various purposes. Ensuring the use of waste for the production of organic fertilizer (compost) in the rural areas.

6.2.2 Policies on Rural Water Supply and Sanitation

1) Water Supply

In order to make the water supply system sustainable, water would be supplied at cost. However, educational and religious institutions will be provided with water as per existing government rules.

In the near future, a water tariff shall be determined on the basis of the cost of water production,

operation and maintenance, administration and depreciation.

Water Supply and Sewerage Authorities (WASAs) shall be responsible for a sustainable water supply in the metropolitan areas where WASAs exist, whereas in other urban areas the Pourashavas (Municipalities) with the help of DPHE shall be responsible for the service.

WASAs and the Pourashavas shall be empowered to set tariffs, by-laws, appointment of staffs, etc. according to their needs and in accordance with the guideline laid down by the government.

WASAs and the Pourashavas shall improve their operational efficiency including financial management. In the near future, billing and collection targets will be 90 and 80% respectively.

Pourashavas and WASAs will take actions to prevent the wastage of water. In addition, they will take the necessary steps to increase public awareness to prevent the misuse of water.

Pourashavas will take the appropriate measures to reduce unaccounted for water from 50 to 30%. Dhaka WASA and Chittagong WASA will also lower their unaccounted for water from the present level.

In order to promote operational efficiencies the government's development grant to the Pourashavas shall take into account the following:

(1) Water supplies coverage in terms of area and population;

(2) Quality of un-accounted for water;

(3) Increase in revenue income.

Private sector participation will be promoted through BOO/BOT and other arrangements. For this purpose opportunities will be created for involving the private sector in billing and collection. The government will prepare a guideline on private sector participation in the sector.

Monitoring of water quality for the purpose of ensuring an acceptable standard will be the responsibility of DPHE, DOE, BSTI, Atomic Energy Commission (AEC) and CBOs and they will send their report to the water quality control committee in the Local Government Division.

WASAs and relevant agencies shall support and promote any collective initiative in slums and squatters in accessing water supply services on payment.

NGOs will play an appropriate role in undertaking motivational activities.

2) Sanitation

The sanitation system shall have to be self-sufficient and self-sustaining. Sanitary latrines in every household will be promoted. Along with individual sanitation, public and community latrines will be set-up by City Corporation/Pourashava and leased out to the private sector for maintenance.

The City Corporations or Pourashava shall be responsible for solid waste collection, disposal and their management. These organizations may transfer, where feasible, the responsibility of collection, removal and management of solid waste to the private sector. Where WASAs exists,

they shall be responsible for sewerage and storm water drainage systems.

Drainage systems in the cities and municipalities will be integrated with the overall drainage system with coordination of the Ministry of Water Resources.

Behavioural development and changes in user communities shall be brought about through social mobilization and hygiene education in alliance with the Ministries of Health, Education, Social Welfare, Information, Women & Children Affairs, DPHE, NGOs, CBOs, local government bodies and other related agencies.

Measures will be taken to recycle, as much as possible, waste materials and to prevent contamination of groundwater by sewerage and drainage.

6.2.3 The Legal Frame work

With regard to the water supply and sanitation sub-sector, the Local Government Division will be responsible for overall planning, identification of investment projects and coordination of activities of agencies under it (viz. DPHE, LGED, WSASs) with local government bodies, the private sector, NGOs and CBOs (community-based organizations). But each of the relevant organizations/institutions will be responsible for its own activities. To coordinate, monitor and evaluate the activities of the sector and to determine the future work program, Local Government Division will constitute a forum with representatives from relevant organizations.

Except Dhaka and Chittagong City areas, DPHE will be responsible for the water supply and sanitation of the whole country. In other urban areas, the Department of public Health Engineering will solely or jointly with the Pourashava be responsible for such services. In urban areas DPHE will be responsible for assisting the Pourashava and City Corporations (except in the cities of Dhaka and Chittagong) through infrastructures development and technical assistance as may be necessary. Besides, both in rural and urban areas, DPHE will increasingly collaborate with the private sector, NGOs and CBOs.

Relevant WASA will be responsible for water supply and sanitation in Dhaka and Chittagong City areas. Involvement of the private sector in these activities will be explored and examined.

Local Government bodies like Zilla parishad, Upazila parishad, Union parishad and Gram parishad will be gradually provided with more scope to contribute in the activities of this sub sector.

A congenial atmosphere will be created and the necessary support provided to facilitate increased participation of the private sector, NGOs and CBOs in the activities of the sector both in rural and urban areas.

The private sector and NGO investment will be encouraged in the manufacturing, sale and distribution of different types of tube wells, sanitary latrines, etc. They will also be encouraged to participate in the installation of piped water supply systems where feasible.

All relevant organizations will give emphasis on the reduction of dependence on groundwater

and increased use of surface water. They will ensure the storage, management and use of surface water.

6.2.4 Strategy Objectives

The strategy of the National Drinking Water Supply and Sanitation policy will be developed on the following principles:

a) All sector development activities shall be planned, coordinated and monitored on basis of a sector development framework which will be prepared after the formulation of the policy;
b) Participation of user in planning, development, operation and maintenance through local government and community based organizations of the stakeholders;
c) Development of water supply and sanitation sector through local bodies, public-private sector, NGOs, CBOs and women groups involving local women particularly elected member (of the local bodies in the sector development activities).
d) Gradual community cost-sharing and introduction of economic pricing for services;
e) Assigning priority to under-served and un-served areas;
f) Adoption of water supply and sanitation technology options appropriate to specific regions, geological situations and social groups;
g) Local Government institutions / Pourashavas to bear increasing share of capital cost; management, wastage and leakage. Poor management generates lack of confidence, which discourages existing consumers to pay water bill and people to take new connections. Unaccounted for water and fewer connections again contribute to less revenue income. In Bangladesh, all these factors form a vicious cycle where the sustainability issue is trapped.

6.2.5 Policy, law, legislation

1) Regulations Concerning Pourashava

It is a mandate of the Pourashava to render water supply services to its urban dwellers. However, in an urban center where WASA (water and sewerage authority) exists the services will be delivered by WASA. The Local Government Division of Ministry of Local Govt, Rural Development and Cooperatives has prepared a set of regulations for municipal water supply system captioned “Pourashava water supply standard by-laws 1999”. The following sections are describing briefly the said regulations.

Water Tariff: For Municipalities the regulation has conditionally empowered the municipalities to set their own tariff structure. The municipalities are required to obtain prior permission from the ministry to implement it.

The Municipality can, in case of metered house connections, fix up the water rate from time to time with prior permission from the ministry. In the case of a temporary connection, the Pourashava will fix up the cost of water consumed on a daily basis. The by-law also states that

the Pourashava will take the necessary steps to get the faulty meter repaired and the water rate will be fixed up on the basis of the previous 3-month bill payment of water bill. The by-law also states that the consumers should pay the water bills to the Pourashava authority within a time period as fixed by the authority, failure of which Pourashava can disconnect the line at default, under the following conditions:

- Pourashava will serve a notice after a month of expiry of the schedule date of payment asking the defaulting consumer to pay all the arrears including the surcharge within a month after the date of issue of the notice.
- If the consumer does not pay within the time given to him, the Pourashava will give another months time to pay all the arrears.
- If the consumer again fails to pay the arrears, the Pourashava will serve a final notice giving another fifteen days.
- If payments are not made within this period, the Pourashava will disconnect the line at default after expiry of that period.
- The Pourashava can impose a surcharge of 5% of the billed amount if bills are not paid within the time as mentioned in the bill.
- In the event of an illegal connection, the Pourashava is empowered to disconnect the connection without serving any notice.
- A disconnected line can be reconnected subject to full payment of all the arrears and connection charges.
- Recovery of Arrears: All the arrears under this by laws will be subject to recovery under “Public Demands Recovery Act 1913”.
- It is observed that, unlike the water rates, the connection fees are mentioned specifically and made unified for all Pourashavas. The regulation describes that appropriate connection fees should be deposited in order to get a water connection to the concerned Pourashava.

2) Regulations Concerning WASA

The Major tariff regulations of Dhaka WASA are summarized below:

1. The authority, may, in the prescribed manner, levy and collect water and sewer rates for its services - provided that no water and sewerage rate shall be levied or collected in any area until the authority makes provision for water supply and sewerage services within its jurisdiction and until the rates are submitted to Government and approved by it.
2. The rates or charges for the services maintained by the authority shall be reviewed once a year, or at any time for special reasons, and may be revised once every five years or earlier; and the revised rates, if any, shall not be realized without the prior approval of the Government with the exception that (a) if the operation and maintenance cost increases due

to inflation or other reasons, such as an increase in the cost of electricity/chemicals, the authority can increase, with the approval of the board, the existing tariff not exceeding 5% each year, without approval of the Government and (b) if the operational cost increases by more than 5% due to inflation or other cogent reason, the Government may delegate authority to increase the tariff.

3. All water and sewer rates shall be made public and displayed publicly at least thirty days prior to the date of their coming into effect.
4. No other organization shall engage in the business of, or creating or maintaining any facility for, collection, pumping, purification, storing & distribution of water, or in the business of creating or maintaining a sewerage work, within WASAs jurisdiction, provided that until such time as the authority is able to provide such facilities, the permission, when requested shall be granted to the applicant on conditions and rates as specified by the authority.
5. The authority may allow rebate to its consumers for timely payment of water & sewerage rates.
6. Cutting of water connection:

(1) Notwithstanding anything contained in any other law for the time being in force, the Authority may cut-off,

- Any unauthorized connection, that is, connection without prior permission of competent authority, or connection not in accordance with such permission, at any time; and
- Water connection of a consumer for non-payment of water or sewer rate with one month's notice thereof to the consumer to be served in the prescribed manner.

(2) No person shall make or cause to be made an unauthorized connection and such connection shall be construed as an offence.

(3) Existing Legislation

a. The public Health (Emergency Provisions) ordinance, 1944.

This is an ordinance to make special provisions in regard to public health. This is a framework kind of legislation with the provision to make rules, which, among others, may " prescribe any disease against the spread of which special precautions are considered by the Government to be necessary" and " prohibit" any act which in the opinion of the Government is likely to lead to or facilitate the spread of any disease prescribed under the above clause.

b. 1963 Water Supply and Sewerage Authority Ordinance.

An ordinance to provide for the construction, expansion, operation and maintenance of water and sewerage works and other facilities relating to environmental sanitation and for the constitution of the authority therefor. The ordinance came into force with effect from November

8th, 1963 for the metropolitan city of Dhaka and Chittagong. There have been several amendments since the ordinance came into force and it was last amended in the year 1996.

c. National Water Policy, 1998

The policies set forth are considered essential for addressing the objectives of improved water resources management and protection of the public health. Every public agency, every community, village and each individual has an important role to play in ensuring that the water and associated natural resources of Bangladesh are used judiciously so that the future generations can be assured of at least the same, if not better, availability and quality of those resources.

It comprises the following important issues:

- River basin management
- Planning and management of water resources
- Water right and allocation
- Public and private improvement
- Water supply and sanitation
- Water and agriculture
- Water and industry
- Water and fisheries and wild life
- Water and navigation
- Water for hydro-power and recreation
- Water for environment
- Water for preservation of haors, baors and beels
- Economic and financial management
- Research and information management
- Stakeholder participation

d. The Environmental Conservation Act (ECA), 2000

The Environmental Conservation Act is currently the main legislative framework document relating to environmental protection in Bangladesh. The Act, called the Environment Conservation Act, 1995 which replaced the earlier environment pollution control ordinance of 1977 underwent amendment in 2000 and has since been renamed as the Environment Conservation (Amendment) Act, 2000. The ECA provides general legislation laying down the principles for obtaining environmental clearance for major new development projects or the expansion and modernization of existing industries in Bangladesh.

e. Environment Conservation Rules (ECR), 1997

The ECR has been promulgated, under the ECA, to evaluate and review the environmental impact of various project and activities. The necessary procedures for environmental approval are also established in this ECA.

Environmental Quality Standards for Bangladesh (EQS) have been set in the ECR to control the ambient environmental quality. The specified limits, which may be damaging to the environment, are shown in the respective standards for the following fields:

- Air quality standards
- Water quality standards (Inland surface water and potable water)
- Noise quality standards (General)
- Noise quality standards (For motor vehicle or mechanical vessel)
- Motor vehicle exhaust quality standards
- Quality standards for mechanized vessels exhaust
- Quality standards for odor
- Sewer discharge quality standards
- Waste discharge quality standards for industrial units and projects
- Gaseous discharge quality standards for industrial units and projects
- Waste emission or discharge quality standards for classified industries (Fertilizer, integrated textile mill & large processing unit)
- Discharge to inland water
- Standards of effluent for industrial or project waste

f. Acquisition and Requisition of Immovable Property Ordinance (1982)

Establishes a procedure for buying or leasing land for development, which may be applicable when acquiring the land necessary for the WTP site, transmission pipeline right-of-way (ROW) and reservoir site.

g. Antiquities Act (1968)

Ensures antiquities of historical, anthropological, religious, military or scientific interest are protected. The government may purchase land holding an antiquity; otherwise, the owner of the antiquity is held responsible for its protection. This Act is not applicable to the project.

6.3 EXISTING SECTOR PROGRAM

6.3.1 Rural Water Supply Programs

Under the GOB financed investment project " Water Supply from ponds of Arsenic and Saline Problematic Areas", steps to be taken to supply pure drinking water from 4,500 ponds of 4,500 villages by the re-excavation of ponds and construction of pond sand filters on the side of the

ponds.

With assistance from UNICEF, the Action Research Program has already been completed in 4 Thanas for the collection and preservation of rainwater as an alternative source of pure drinking water. Under the program, the raising of public awareness and use of pond water including testing of water are given importance. Besides this, different types of arsenic removal filters are tested including rainwater collection and preservation.

The DANIDA assisted "GOB – DANIDA arsenic mitigation project" is going on in eight coastal districts, namely Potuakhali, Barisal, Jhalokhati, Borgona, Pirojpur, Feni, Laxmipur, and Noakhali. The project has selected 28 Thanas within these districts for the intervention of Rural Water Supply and hygiene education through school sanitation programs, rainwater harvesting, and deep hand tube wells.

An extensive feasibility study is being conducted by the JICA expert team in the western part of the country, viz. Jessore, Jenidah and, Chuadanga, in order to find out a way to extract safe water from deep aquifers.

Community Based Water Supply and Sanitation Project (CWSSP)

The CWSSP is now one of the priority areas of the overall 26 components of the SEMP. DPHE is the executive agency of the project. The project objectives are:

(1) Development of a demand - responsive planning and implementation of WSS services;
(2) Development of a mechanism of community management of WSS services;
(3) Development of a methodology of adaptive project design; and
(4) Mainstreaming of the achievement to macro-level WSS intervention through policy reforms.

It is a research-based project. Under this project five Thanas from different areas of the country have been incorporated. Experimental programs of the project have been taken in five Unions of five Thanas in the first phase.

6.3.2 Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP)

The appearance of arsenic in groundwater has posed a threat to public health having a very significant impact on people lives, health, and social and economic activities in Bangladesh. In fact, the arsenic contamination of groundwater has created an additional burden in rural water supply management, demanding water treatment and water quality surveillance. To cope with the situation, a new innovative approach to an "arsenic-free, safe water supply" has been initiated through the Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP). The Project was conceptualized with the joint effort of the Government of Bangladesh (GOB) and the World Bank - Swiss Agency for Development & Co-operation (WB-SDC). The Project Concept Paper (PCP) was approved by ECNEC on June 28, 1998 and the Project Proforma (PP)

was approved by the GOB on August 28, 1998. The "Project Agreement" was signed by the GOB and International Development Agency (IDA) and the project was launched on September 21, 1998. However, the "Credit" was made effective on February 21, 1999.

Objectives of the Project

The overall objective of the project is to reduce mortality and morbidity in rural and urban populations caused by the arsenic contamination of groundwater, through a sustainable safe water supply, and health and management strategies. This project is the first phase of a long-term effort to mitigate the impact of naturally occurring contamination of groundwater by arsenic. The specific objectives are as follows:

- Detecting the causes of arsenic contamination through extensive surveys of hand tube wells, and in-depth assessment of the extent of arsenic contamination of water sources and developing an improved data management system;
- Identification of alternative sources and development of a range of affordable technological options and levels of service for a long term and sustainable solution;
- Construction, rehabilitation and augmentation of water supply and sanitation schemes including emergency activities needed to mitigate arsenic-contaminated community water supply;
- Awareness building on arsenic hazard & hygiene education on environmental sanitation;
- Development, testing, and scaling up of decentralized, community based, cost effective, and demand responsive institutional mechanisms for water supply service delivery;
- Capacity building at the community level, at the levels of Union Parishad, and Municipality and various stakeholders, government agencies and support organizations;
- Preparation of detailed proposals for a national rural and urban water and sanitation program for arsenic mitigation based on lessons learnt for the subsequent phases of investment;
- Creation of employment opportunities at the grass root level and promotion of private initiative in the sector development;
- Set up of Task Force, Steering Committee, Secretaries Committee and National Expert Committee to oversee and promote project activities. Set up of Ward, Union, Upazila & District Arsenic Mitigation Committees to supervise project activities at their areas.
- Building up of partnership with DGHS, GSB, BCSIR, etc. to address arsenic related multi-sectoral issues.

Summary of the Activities

The progress and achievement made so far in the implementation of the Bangladesh Arsenic The Mitigation Project identified in the first 4-year period includes:

- Improved understanding of the arsenic problem through national survey;
- Onsite mitigation through sub-project development and implementation by the Community Based Organizations involving Local Government Initiatives;
- Strengthening the implementation capacity of the Local Govt. entities and Community Based Organizations.

Screening Approach with Local NGO:

The National Survey was conducted based on two approaches. Initially, the survey was piloted in six Upazilas of six divisions and was conducted with the help of 34 local, community-based NGOs. The survey commenced on October 2, 1999 and was completed in three months. During the survey it was felt that the local DPHE set up and the Ward Committees of the Union Parishad should be more intensively involved in the screening program.

Screening Approach Involving Local Govt. (Members of the Union Parishad):

The second phase screening program is being implemented in 35 Upazilas with the participation of the Local Government Institution (Union Parishad) and DPHE. BAMWSP initiated a massive sensitization program throughout the country to involve local government institutions, local administration, and local officials of health services and DPHE in the National Screening Program (NSP-2) and in the arsenic mitigation program.

Community Management in Arsenic Mitigation in 419 Villages:

The Project Steering Committee (PSC) has approved 714 numbers of sub-projects in 419 villages. The Technical Advisory Group (TAG) of BAMWSP has recommended 4 non-chemical based technological options for the short-term mitigation program. The options are:

- Reserve pond with pond sand filter
- Rainwater harvesting
- Dug well and
- Deep tube well

A total of 412 deep tube wells, 260 dug wells and 42 pond sand filters are going to be installed in the field for arsenic safe water supplies in the arsenic contaminated areas.

Screening, Community Development and Mitigation Program in 147 Upazila:

In the next phase of the screening, the community development and mitigation program will be

initiated by involving Local Govt. entities plus NGOs in 147 Upazilas. The bid evaluation for the selection of NGOs/firms is in progress.

Rapid Assessment of Household Level Arsenic Removal Technologies:

A rapid assessment of arsenic removal technologies was initiated to provide an independent, comparative assessment of the performance and acceptability of a range of arsenic removal technologies at the household & community level. The assessment has been carried out in conjunction with BAMWSP and Department for International Development (DFID). The Technical Advisory Group (TAG) has recommended on probation 5 technologies, which are:

- Alcan enhanced activated alumina filter (Alcan)
- BUET activated alumina filter
- Sono 3-kolshi method and
- Stevens Institute technology
- Tetrahedron filters

Finding a Suitable Field Test Kit for Screening and Procurement:

The test kits that were used locally by various stakeholders were tested by the project and found not suitable for field use due to inconsistent results. However, MERCK and HACH Test Kits were found by the TAG to be suitable for field use and recommended for the screening program. MERCK test kits were used in National Emergency Screening Program (NESP-1) and NSP-2 although it has some limitation. The Test Kits were procured in phases considering their availability and effectiveness. The first 1,000 test kits were procured through the National Shopping procedure on September 7, 1999. Another lot of 2,000 MERCK test kits was purchased upon receiving a recommendation from the Project Steering Committee (PSC) and No Objection Certificate (NOC) of IDA on November 17, 1999. The delivery was completed on December 16, 1999. The procurement of 8,000 kits through the NCB procedure was completed on July 6, 2000. BAMWSP is procuring 50,000 HACH test kits for its next screening program.

- The Procurement of 50,000 kits through the ICB procedure was initiated on January 18, 2000. But all the bidding was found non-responsive. A request letter was sent to the Ministry for procurement of 50,000 arsenic test kits through LIB on August 7, 2000. A request letter in this regard was sent to IDA on August 16, 2000 and response received for inviting fresh tender through ICB on September 6, 2000.
- The second ICB tender was invited on October 10, 2000 and five tenders were received on December 19, 2000. The evaluation committee after a detailed laboratory test has found HACH kit to be suitable and acceptable. On recommendation by TAG, the concerned authority has approved the bid submitted by HACH Company.

Partnership approach:

BAMWSP has launched the new Partnership approach. Under this approach BAMWSP will build a partnership with different organizations to strengthen and promote the smooth progress of the multi-sectoral activities. At present, partnerships are being developed with

- BCSIR: For technology validation
- Ministry of Health & DGHS: For health relief to Arsenic affected Patients
- Ministry of Information: For intensive dissemination of Arsenic related message to the people
- GSB & other related agencies: For hydrogeological investigation of deep ground water aquifer

Arsenic Health Awareness and Mitigation Information:

Information, Education and Communication (IEC) at the community level are a critical component for ensuring the people's participation in program implementation. Keeping this in view, BAMWSP developed a communication strategy for a pragmatic awareness campaign at the national and field levels. The strategy includes objective, target audiences, areas of messages, channels of communication and guidelines for proper implementation to achieve the goal of mass awareness.

Training of Health Personnel on Management of Arsenicosis Patient through Bangladesh Medical Association (BMA):

The health impact of arsenic in the drinking water is still very unclear. This is mainly due to lack of reliable epidemiological data as well as scientific knowledge. The recent emergency of the health problem also indicates the reality that the health personnel/ workers do not have enough knowledge about arsenic, and its health impact. To overcome the situation, it has become essential to undertake a program for medical professionals at the community level to enrich their knowledge about arsenic, its toxicity, its effect on the human body, diagnosis, treatment and preventive measures and to establish a network with the Upazila Health Complexes for developing the medical referral system. In view of this, the Bangladesh Arsenic Mitigation Water Supply Project (BAMWSP) has signed an agreement with the Bangladesh Medical Association (BMA) on August 28, 2000 for the capacity building of health personnel from the national level to the grass root level under the Health Sector Strengthening Program (HSSP), and the training program was completed in June 2001. Under this program about 2,000 doctors and 11,000 health workers were trained.

Formation of Arsenic Mitigation Committees at Ward, Union, Upazila and District Level

As it has been observed that the groundwater of different areas of the country is contaminated

with arsenic, the Government has recently decided to establish 'Arsenic Mitigation Committees' at the Ward, Union, Upazila and District levels so as to mobilize the community to undertake the screening of tube wells contaminated with arsenic, to identify affected patients, and to provide the arsenic-free safe water supply to the community.

A. Ward Arsenic Mitigation Committee:

1.	Female Ward Member	(01)	Advisor
2.	Ward Member	(01)	President
3.	Health Worker / Family Welfare Assistant	(01)	Member
4.	Block Supervisor	(01)	Member
5.	Ansar / Village Defence Party (VDP) Worker	(01)	Member
6.	Imam of a Mosque	(01)	Member
7.	Freedom Fighters' Representative	(01)	Member
8.	Teachers' Representative	(01)	Member

The Ward Committee will select a suitable member to become the Member - Secretary of the Committee. If necessary, the committee may include two more members from the local elite. Their controlling authorities will select the members of Sl. No. 3, 4 and 5. The Union Parishad will select the members of Sl. No. 6, 7 and 8.

Scope of work of the Committee

a. Establishing a Field Survey Team (FST) in each Ward with an aim to screen arsenic contaminated tube wells and identify patients.
b. Finalization of local screening programs and schedule of the training for FSTs in each Ward.
c. Implementation of the screening program of testing water of tube wells and identification of arsenic affected patients.
d. Maintaining continuous mass communication on arsenic contamination and mitigation.
e. Taking initiatives for establishing Village Water Supply Organizations with an aim to develop an arsenic-free, safe water supply system.
f. Undertaking of any other relevant activities.

B. Union Arsenic Mitigation Committee:

1.	Union Parishad (Council) Chairman	(01)	President
2.	Female Members of the Union Parishad	(03)	Members
3.	Members of the Union Parishad	(09)	Member
4.	Assistant Health Inspector	(01)	Member
5.	Family Planning Inspector	(01)	Member

6.	Teachers' Representative	(01)	Member
7.	Ansar / VDP Leader	(01)	Member
8.	Freedom Fighters' Representative	(01)	Member
9.	Secretary of the Union Parishad	(01)	Member-Secretary

If necessary, the Union Committee may include a maximum of two more members from the local elite. The Upazila Education Officer and the Upazila Freedom Fighters' Command Council will select the representatives of Sl. No.6 and 8 respectively.

Scope of work of the Committee

a. Formation and supervision of Ward Arsenic Mitigation Committee in each Ward.
b. Planning, coordination and ensuring proper implementation of Ward-wise screening program.
c. Providing overall cooperation to the Ward Arsenic Mitigation Committee in addressing arsenic problems.
d. Maintaining regular communication with the Upazila Arsenic Mitigation Committee and
e. Undertaking of any other relevant issues.

C. Upazila Arsenic Mitigation Committee

1.	Upazila Nirbahi (Executive) Officer (UNO)	(01)	President
2.	All Union Parishad Chairman of the Upazila	(01)	Member
3.	Upazila Healths and Family Planning Officer	(01)	Member
4.	Upazila Agriculture Officer	(01)	Member
5.	Upazila Statistics Officer	(01)	Member
6.	Upazila Education Officer	(01)	Member
7.	Upazila Social Welfare Officer	(01)	Member
8.	Upazila Ansar / VDP Officer	(01)	Member
9.	Teachers' Representative (1 Female & 1 Male)	(02)	Member
10.	Freedom Fighter Representative	(01)	Member
11.	Sub-Assistant Engineer (SAE), Dept. Public Health Engineering (DPHE)	(01)	Member - Secretary

If necessary, the Upazila Committee may include a maximum of two (including one female) more members from the local elite. The Upazila Nirbahi Officer and the Upazila Freedom Fighters' Command Council will select the representatives of Sl. No. 9 and 10 respectively.

Scope of work of the Committee:

a. Ensuring the formation of a Ward and Union Arsenic Mitigation Committee in each Ward and Union

b. Providing overall cooperation to the Union Arsenic Mitigation Committees
c. Coordinating and monitoring of the entire arsenic mitigation program within the Upazila
d. Maintaining regular communication with the District Arsenic Mitigation Committee and
e. Addressing and undertaking any other relevant issues and assisting in implementation

D. District Arsenic Mitigation Committee:

1.	Deputy Commissioner	(01)	President
2.	Police Super	(01)	Member
3.	Civil Surgeon	(01)	Member
4.	Deputy Director, Deptt. of Agriculture	(01)	Member
5.	Executive Engineer Local Govt. Engineering Deptt.	(01)	Member
6.	Deputy Director, Deptt. of Social Welfare	(01)	Member
7.	District Information Officer	(01)	Member
8.	District Statistics Officer	(01)	Member
9.	District Education Officer	(01)	Member
10.	District Ansar and VDP Officer	(01)	Member
11.	All Municipality Chairmen of the District	Member	
12.	All UNOs of the District	Member	
13.	District Woman Affair Officer	(01)	Member
14.	Teachers' Representative (1 Male & 1 Female)	(02)	Member
15.	Freedom Fighters' Representative	(01)	Member
16.	Executive Engineer, DPHE	(01)	Member

If necessary, the District Committee may include a maximum of two (including one female) more members from the local elite. The District Education Officer and the District Freedom Fighters' Command Council will select the representatives of Sl. No.14 and 15 respectively.

Scope of work of the Committee:

a) Ensuring the formation of a Upazila Arsenic Mitigation Committee in each Upazila
b) Providing guidelines and overall coordination of the arsenic mitigation activities in the district
c) Coordinating and monitoring of the entire arsenic mitigation program within the district.
d) Addressing and undertaking any other relevant issues and assisting in implementation.

6.4 Problems of Water Supply facilities in Target Area

The water supply project in the Bangladesh is under the jurisdiction of Ministry of Local Government Rural Development and Co-operatives. The water supply project in both cities of Dhaka (Narayanganj is included) and Chittagong are under the jurisdiction of WASA. The water

service in all other local cities and rural regions is under the jurisdiction of DPHE.

6.4.1 Urban Water Supply Facilities in Target Area

1) Current status

There are seven urban water supply facilities in the target area of the investigation. The problem and the measures of these urban water supply facilities are described in another chapter (Chapter 2.4). The deficit is boarded by the subsidy. The causes on the facilities side are as follows.

a. Water Quantity Management

Three water supply systems, Jessore, Jhenaidah and Chuadanga have set up the overhead tank. The groundwater is pumped up to the overhead tank. Then, groundwater is supplied from the overhead tank to each consumer by gravity flow. But four water supply systems Sailkupa, Kaligonji, Kotchandpur and Moheshupur have not set up overhead tanks, and groundwater is supplied directly from the production well pump. The flow meter is not installed in any part of water supply systems with the exception of 2 or 3. The meters installed are a voltmeter, an ammeter and a pressure gauge at the distribution pump of the outflow side. The storage tank is not equipped with a water level gauge. It seems that the amount of each well production and the amount of water delivery are calculated by multiplying the operation time by the capacity of the pump. Moreover, the operating records are insufficient. Therefore, the accurate measurement records that can be used for management and technical evaluation were not properly preserved in the office.

b. Water quality management

The water quality in the aging of the production well water and the water quality at the end of distribution pipe that changes hourly, are not regularly examined.

The main water quality problems are iron content and coliform bacteria (except arsenic). The relation between the content of the iron and the color is well known. If the color is measured and recorded, the iron content can be presumed. Concerning the measurement of coliform bacteria, special equipment and techniques are necessary. However, it is already understood that bacteria can be removed by chlorine disinfection. The measurement of the residual chlorine is easy. If the residual chlorine is measured and recorded, the safety of water can be guaranteed.

c. Water Supply Service Time

It seems that 12-hours of water supply a day is assumed to be a standard in a local city. Seven Pourashavas in the study area operate the water supply facility 2 to 10 hours a day.

Such an operation creates an extremely dangerous situation. While stopping distribution, the

polluted seepage water might be drawn into the distribution pipes. When the distribution is driven again, the polluted water might be supplied to each house.

d. Water Treatment

The water quality parameters that become a problem are arsenic, iron and bacillus pollution. According to the investigation of the study team concerning arsenic, the arsenic concentration of the production wells in Chuadanga and Moheshupur exceeded the Bangladesh standard value of 0.05 mg/l. Arsenic removal treatment facilities are necessary for these two Pourashavas.

The Bangladesh standard for iron is 0.3 to 1.0 mg/l and the iron content of 5.0mg/l is allowed according to the region. When thinking of this standard, as long as there is no complaint about the smell or taste of water, it is thought that a high level of iron content is allowed. According to the investigation of the study team, though a high level of iron content has been detected in Jessore and Kaligonj, etc. in a few wells, it is assumed that the water supplies fall below the standard value because they are diluted with other well water. The iron removal treatment facilities need not be processed.

Three iron removal treatment facilities consisting of an aeration chamber, sedimentation basin and the rapid sand filter were set up in Jessore. However, this is not operated now. The reason for the stopping operation is possibly explained by the fact that the operation cost is too high. Moreover, because the treatment facilities are facilities where 24 hours operation was required, the operation that corresponds to the hourly water supply is guessed to be extremely complex.

Because the water source is deep wells, bacillus pollution is not considered. However, it is necessary to prevent secondary pollution with the water supply facilities. Though the distribution pipelines have been washed by using the bleaching powder 1 or 2 times a year, it is insufficient. The continuous injection of chlorine by which residual chlorine is maintained is indispensable.

e. Overhead Tank

It is general that the water supply method adopts a gravity flowing from the overhead tank because it is very smooth land.

However, there is no overhead tank in Sailkupa, Kaligonj, Kotchandpur and Moheshupur and groundwater is supplied directly by the production well pump, though Jessore, Jhenaidah and Chuadanga have an overhead tank. With this, it is not possible to correspond the consumption change of the time of the customer at all.

When the amount of use is calculated from the information data of these four pourashavas, it becomes 1.6 to 6.2 m^3/house/day. It does not seem that such a large amount of water is used during the water supply service time of only several hours a day. Most is wasted or leaks, and these facilities should be called a river rather than a water supply service system.

f. Master Meter

Though the flow meter is set up in a few well pumps, the flow meter is not set up in most well pumps. Moreover, the flow meter is not set up even in the overhead tank outlet pipe.
Accurate water-consumption cannot be measured.

g. Water Meter

The meter is not set up at all by each customer. The water tariff is a flat rate charge set depending on the diameter of the house connection pipe. The commodity charge is not set. Therefore, because it is a fixed amount no matter how water is used, the waste of water and the water leak are promoted.

Recently, DPHE completed the water supply project of 18 District Town (18DTP), and incompleteness on the legislation side and the organization side has been recognized through 18DTP. M.A.I.Choedry et.al summarizes the current state and the problem based on this experience as follows (Journal of Water Supply Research and Technology - AQUA 50.5 2001).

(1) Production capacity should be increased to fulfill the demands of the growing population in towns using both surface and ground sources. Priority should be given to surface sources where arsenic and salinity content exceed allowable limits.

(2) A comprehensive water quality management policy should be developed embodying the principles of pollution prevention, a precautionary approach and a receiving water quality objective that will meet user's requirements. In this regard, the water quality of treatment plants and deep tube wells should be tested regularly.

(3) To ensure that water quality remains within the permissible limits, proper water treatment must be performed especially in cases of surface water as a safeguard against water borne diseases. IRP should be constructed in towns like Magura and Nasail where iron exceeds the allowable limits (Fe > 1 mg/L). Combined iron and arsenic treatments of the same size should be taken into consideration in cases of groundwater abstraction where arsenic and iron content are excessively high.

(4) The distribution system should be expanded to ensure adequate water supply to the consumers. It is recommended that pipes under roads or drains be provided with a reticulation system.

(5) As service mains and connections are the major sources of leakage, due consideration should be given to upgrading service mains of diameter < 100 mm and house connection. Provision should be made to the house connection from the reticulation lines. New house connections must be laid in the presence of water works officials and materials for house connection should be supplied by the water works to ensure proper workmanship and quality of fittings.

(6) Modified street hydrants should be constructed in slum and fringe areas to reduce

wastage of water.

(7) Operation and maintenance of all the accessories of the water supply network should be strictly maintained.

(8) To keep NRW within acceptable limits (within 5 15% of water production), the development of a sound leakage control strategy should be enacted following an economic evaluation. In this regard, handling of the leakage and wastage problem in the water supply system, leakage control performance through passive methods and regular sounding should be monitored with a programme of data collection as part of the leakage survey. Data collection and recording system should be established for each water supply zone and sub-zones covering information such as man hours spent on active leakage control, broken down in detection, location and equipment maintenance, level of leakage, occurrence of burst, repair cost and frequency of mains, communication pipe and supply, cost of new equipment, installation for leakage control, zone reconfiguration and staff training in the leakage detection department of the water works (Bossey 1995).Active leakage control at an interval of five to ten years should also be conducted and leaks repaired without dalay.

(9) PWSS should have regular work programmes to rehabilitate the existing distribution system as well as the production system.

(10) Conversion of non-metered connections to metered ones should be initiated in each town as soon as possible.

(11) Service level should be improved through increased supply pressure to at least 105 Pascal or 105 N/m2 during normal supply hours to create consumer confidence in the water supply system. In this regard continuous instead of intermittent water supply should be ensured for minimizing wastage.

(12) Revenue generation should be increased by streamlining revenue management functions or privatization of billing. To secure cost recovery, water tariffs as well as collection efficiency shall be increased gradually.

(13) The community must be motivated to participate in all kind of activities related to the water supply system and to raise public awareness about the adverse effect of leakage and wastage as well as to increase willingness to pay.

(14) A double-entry accounting system should be initiated to improve the financial status of PWSS until a standard utility type account is introduced.

(15) Existing water bylaws should be enforced against illegal connections and unauthorized bypass lines and to realize reasonable water tariffs.

(16) Selected personnel from the operation and maintenance section as well as the revenue management section should be trained from time to time to improve the overall performance of PWSS.

2) Improvement Plan of Pourashava Water Supply Systems in Arsenic Affected Areas

There are a lot of problems like the description in the preceding clause, and rehabilitation is necessary. However, the extent of arsenic pollution in deep wells, which are the Pourashava water source, is 0.08mg/l at the highest value and the concentration of contamination is comparatively low. The allowable arsenic concentration standard of Bangladesh is 0.05mg/l, and only the two Pourashava's water supply systems of Chuadanga and Moheshupur need the arsenic removal treatment facilities.

In Satkhira and Manikganj, in a similar situation of the vicinity, a comparatively easy aeration and rapid filter are operated to remove iron and arsenic. Arsenic can be decreased below the standard value at the same time as removing iron when the treatment results are investigated. The processing facilities compactly on the whole make the aeration equipment and the rapid sand filtration equipment in the structure. The operation is also comparatively easy. Operation and maintenance management is excellently performed in Satkhira and Manikganj.

If the arsenic pollution is about 0.1mg/l or less in local urban water supply systems, this facility can be recommended as a standard facility.

Though seven Pourashavas are in a seriously arsenic affected area, they have a large amount of safe water not polluted by arsenic. However, only a small number of people possess this safe water (population served by individual house connection is 5 to 40%), and it can be said that they will waste the arsenic safe water. On the other hand, the drinking water source of a lot of people is conventional HTW in the Pourashaba community area and uneasiness in their daily lives is caused by the arsenic pollution. In these HTW, there is an urgent need to screen and to monitor the rural region as well and to specify arsenic safe wells.

At the same time, to people who live in the urban area, and do not receive the piped water supply, there is an urgent need to transport and deliver the drinking water from the Pourashava water supply systems. There are a lot of transportation methods, for instance, by manpower, rickshaw, water truck, pipe etc. It is necessary to organize the transportation methods according to the situation in the region. The rehabilitation of the water supply systems that leak a large amount of arsenic safe water is necessary.

Rehabilitation is executed based on the following basic concept.

- Maximum utilization of the existing water supply systems: water supply systems in operation are suffering from decreased production, less than the design capacity originally intended. To achieve maximum utilization of the water supply works constructed, particular attention is paid to rehabilitation rather than expansion of the systems.
- Appropriate technology: minimum use of mechanical and electrical equipment that

requires special skills for operation and maintenance in planning water treatment and distribution. Gravity supplies are proposed, pumping being limited to areas where it requires.

- Cost effectiveness: through cost analyses of the proposed plans, the Study should seek most cost effective solution to achieve the target.
- Universal metering: all individual and non-individual connections should be metered and a water tariff should be levied on the basis of water consumption. In the case of a small-scale water supply like community self-help systems in rural areas, a flat rate tariff might be allowed although a metering system is recommended. The water tariff applied, however, should be high enough to balance costs required for routine operation and maintenance.
- Safe and Potable Water: all systems shall exercise chlorine dosage for disinfection to produce safe and potable water continuously as minimum requirement.

6.4.2 Rural Water Supply Facilities in Target Area

There are few piped water supplies in the rural region, and a lot of hand tube wells are used for domestic use. About 3,000 hand tube wells are used in the example of Kesabpur Union, and 25% of them were constructed and have been managed by DPHE. Though after the occurrence of arsenic pollution, DPHE has not constructed new wells. A caretaker is elected when constructing a tube well, and is trained in the daily method of maintenance, and management is requested. Four mechanics are in charge of the maintenance of tube wells in nine unions. The mechanics go to the unions and give guidance in repair methods, etc. requested by the caretaker. If parts need to be replaced, etc., the parts are offered cheaper than the market price. As for the repair expense, people generally have not become accustomed to the mechanism of saving money on a monthly basis, though responsibility is shouldered by the beneficiary when a break-down occurs.

The conversion to safe groundwater has progressed from the use of water from an unsanitary ponds and rivers in Bangladesh; 97% of the people were able to access safe drinking water (UNICEF); however, since the occurrence of arsenic pollution in groundwater, this ratio has decreased greatly.

The JICA Study Team clarified the arsenic pollution situation in the target area. 35% of the wells on average exceed the Bangladesh standard of 0.05mg/l. 70% of the wells or more exceed the standard according to the Thana. Therefore, if the investigation is done with narrow a little more range, Union or Mouza, it is presumed that the region which has been polluted by 100% there. There is an urgent need to supply arsenic safe drinking water to such a region.

It is guessed that 100% of the groundwater is polluted in the region. This arsenic pollution problem should be solved as soon as possible, and it is necessary to construct a safe, pleasant

water service system at the same time.

Table 6.4.1 Arsenic Contamination Ratio analysed by AAS sampled on June to July 2000

District	Thana	Sample	<0.05mg/l		0.05mg/l <		0.1mg/l <		0.4mg/l <	
Jessore	Jhikargachha	13	6	46.2%	7	53.8%	7	53.8%	1	7.7%
Jessore	Sharsha	12	4	33.3%	8	66.7%	5	41.7%	0	0.0%
Jessore	Keshabpur	13	5	38.5%	8	61.5%	5	38.5%	1	7.7%
Jessore	Jessore Sadar	21	16	76.2%	5	23.8%	3	14.3%	0	0.0%
Jessore	Manirampur	23	14	60.9%	9	39.1%	3	13.0%	1	4.3%
Jessore	Chougachha	14	3	21.4%	11	78.6%	8	57.1%	4	28.6%
Jessore	Bagherpara	13	10	76.9%	3	23.1%	3	23.1%	0	0.0%
Jessore	Abhaynagar	9	8	88.9%	1	11.1%	1	11.1%	0	0.0%
Jhenaidah	Jhenaidah Sadar	25	20	80.0%	5	20.0%	3	12.0%	1	4.0%
Jhenaidah	Kaliganj	16	14	87.5%	2	12.5%	1	6.3%	0	0.0%
Jhenaidah	Kotchandpur	8	5	62.5%	3	37.5%	1	12.5%	0	0.0%
Jhenaidah	Moheshpur	15	7	46.7%	8	53.3%	2	13.3%	0	0.0%
Jhenaidah	Harinakunda	8	6	75.0%	2	25.0%	1	12.5%	0	0.0%
Jhenaidah	Sailkupa	17	16	94.1%	1	5.9%	1	5.9%	0	0.0%
Chuadanga	Alamdanga	19	15	78.9%	4	21.1%	2	10.5%	0	0.0%
Chuadanga	Damurhuda	12	8	66.7%	4	33.3%	3	25.0%	0	0.0%
Chuadanga	Chuadanga Sadar	14	8	57.1%	6	42.9%	2	14.3%	0	0.0%
Chuadanga	Jibannagar	8	3	37.5%	5	62.5%	4	50.0%	3	37.5%
Total	18	260	168	64.6%	92	35.4%	55	21.2%	11	4.2%

References (National Policy)

STATUS REPORT OF BANGLADESH ARESENIC MITIGATION WATER SUPPLY PROJECT. BAMWSP. December, 2001.

Brochure: Local Government Engineering Department

Brochure: DPHE At A Glance. Department of Public Health Engineering DPHE Bhaban, Kakrail, Dhaka-1000.

REPORT ON THE SEMINAR-CUM-WORKSHOP ON LESSONS LEARNT ON WATER SUPPLY AND SANITATION. April 25, 2000; Dhaka. Community Based Water Supply and Sanitation Project (CWWSP). Sustainable Environment Management Programme (SEMP). Department of Public Health Engineering (DPHE).

National Water Policy. Ministry of Water Resources.

Amin Uddin Ahmad, Local Consultant. Preliminary Country Report. ADB Sponsored Study on Regulatory Systems and Networking of Water Utilities and Regulatory Bodies T.A. No.

5922. January 16, 2001.

RULES OF SUSINESS 1996 (Revised up to August, 2000) With 1. ALLOCATION OF BUSINESS AMONG THE DIFFERENT MINISTRIES AND DIVISIONS (Revised up to August, 2000) 2. WARRANT OF PREFERENCE, 1986. CABINET DIVISION.

Brochure: Arsenic Mitigation Activities by DPHE. Department of Public Health Engineering.

Annual Report 1998-99. Dhaka WASA BOAD.

DPHE's Activities

Annual Development Programme: 2001-2002.

Report on DPHE's activities for inclusion in the speech of the Honarable President in the Perliament.

Report of Project Implementation.

CHAPTER 7

WATER SUPPLY FACILITIES PLAN

Supporting Report 2

CHAPTER 7 WATER SUPPLY FACILITIES PLAN

7.1 Outline of Possible Water Supply Facilities

7.1.1 Arsenic Mitigation Strategy

About ten years have passed since the arsenic pollution of underground water was confirmed in Bangladesh. The prospect of a solution is not looking up though various investigations are still zealously done. BAMWSP enthusiastically promotes screening, and completes about 50% of the screening. However, at present there are still difficulties in securing an alternative water source such as the fund shortage, etc, which have not improved at all .

Strategy to Solution

It is thought that it is necessary to execute the following measures.

1) The First Stage

a. Screening of all Existing Wells

The arsenic safe wells should be specified, and joint use by nearby residents should be promoted.

b. Development of Alternative Water Sources (for Drinking and Cooking).

It is necessary to develop an arsenic safe water source(s) if there is no safe well. Alternative sources are as follows.

(1) Rain water harvesting.
(2) Use of pond water (Pond sand Filter).
(3) Purification of conventional well water (iron removal device and activated aluminum filtration, etc.).
(4) Simple arsenic removal device (domestic use).
(5) Development of deep underground water.

2) The Second Stage

The access distance to the arsenic safe water source may become far in the first stage measures. If there is a public stand post of arsenic safe water near an existing well, the residents can obtain water without changing their lifestyle according to water use. It is therefore necessary to construct the following facilities to achieve such a situation.

- Overhead tank.
- Transmission pump (include generator).
- Distribution pipe (PVC).
- Public stand post.

In this case, who operates these facilities and who bears responsibility for the maintenance expense etc. becomes an important issue. This stage cannot be achieved without a solution to this problem.

3) The Third Stage

There is a region without an appropriate surface water source, and there is a region where the development of arsenic safe deep underground water is impossible. To these regions, a water supply plan to supply arsenic safe water to a wide area is necessary. The following strategies are thought for this solution.

The water source is made by an existing urban water service or a newly constructed urban water service. The existing urban water service is in operation for several hours in the daytime, and arsenic safe water is wasted due to water leakage, etc. If water leakage is prevented, and the operation time is extended, enough drinking water that is necessary in the rural area can be produced. It is necessary to construct the following facilities to supply arsenic safe water to the rural area.

- Rehabilitation of existing urban water service.
- Water supply pump station to rural area.
- Construction of water transmission pipe and distribution pipe to rural area.
- Construction of receiving water tank in each village.
- Water service facilities in the village.

Such a situation cannot be achieved if there is no solution to how to do the operation and the maintenance system as well as the second stage.

There is no need to go through these three stages one by one in the solution of the arsenic problem. It can be said that working from the beginning to the 3rd stage is much better if they want to solve the arsenic problem within ten years or so. Anyway, some maintenance expense is necessary. Do the local residents intend to pay? Do the local residents form the operation and maintenance organization? These are key to the success or failure of this measure.

7.1.2 General Condition of Target Area

1) Urban Area

The urban area includes the target area's Thana capital, where government offices and a shopping center are located. The pipe water-supplying facilities have not yet been constructed. The region including the surrounding was promoted to a Pourashava community recently. 50% of the people in the target area reside in this Pourashava area, which is equivalent to 16,800 people now. However, the Pourashava chairman has not been elected yet.

The water service plan is built in the local growth center water service plan project together with

three Pourashava in the Kesabpur Thana. The place of prospecting well site is selected now, and the blueprint of water service will not have been drawn yet.

2) Rural Area

Farmers who center on rice fields form a small village in a rural region centering on blood relationships (Para). Many of these small villages consist of about 30 to 40 scattered households. The ratios of residents other than farmers increase in the vicinity of an urban area, and 100 to 200 large Paras exist, too.

7.1.3 Selection of Water Supply System

The water supply facilities are generally selected based on the situation of the residential area. It is technically reasonable to develop a big water resource that supplies individual houses by a pipe connection . The cost of construction and the maintenance expense per person becomes cheap, too. On the contrary, if requesting a small water resource in each small village, both the cost of construction and the maintenance expense becomes cheap in a sparsely populated, rural region. It is judged that the level 1 hand pump system is reasonable in the rural area and the level 3 individual house connection system is reasonable in the urban area based on this judgment standard.

However, this project concerns the development of deep, arsenic safe groundwater in the region affected by arsenic. It is necessary to at least provide drinking water immediately. The water supply system needs to be examined from this viewpoint.

1) Water Supply System in Urban Area

Though the water service plan in this area has not reached the design stage yet, there is a water service plan for an individual house connection water supply in the future, which is sure to be excluded from this project. However, it might still take 4 to 5 years by the time this plan is completed. It is not possible to leave this area for 4 to 5 years though there is no arsenic safe water resource. Even if the hand pump system (level 1 system) only supplies arsenic safe drinking water, it is necessary to dig a lot of wells in the region where the population density is high. It is impossible to request such a site in the urban area. Moreover, it is difficult to correspond it with the Pourashava water service plan in the future, even if the level 2 systems that supply water with the pipe and stand posts are constructed.

The following water supply systems are available in such a region.

The number of people reliant on one well increases because the population density is high. The well diameter increase which corresponds to the population is inevitable. When the hand pump is applied to it, it does not balance demand because the amount that can be pumped with a hand pump has the limit. A submerged motor pump is needed to match the amount of production to

demand. In this case, a water storage tank is needed at the well site. It will be possible to meet the demand if the water tap "only the necessity" is set up in the water storage tank.

Therefore, the well where the conversion can be used for the water resource of the Pourashava water service in the future is dug in this region. Set up the overhead tank (About 3m in height) at the well site and set up the tap that corresponds to demand. That is, the improved level 1 system is assumed. A public stand post is necessary for the Pourashava water service of the future. The overhead tank set up will be used as a public stand post in the future.

2) Water Supply System in Rural Area

If residents in any region can bear the maintenance cost, drinking water is supplied to each home by piping with pressure, which is both convenient and makes living conditions more pleasant. The construction of the water service system to board the whole domestic water by the drinking water is possible (level 3 system). The construction of the water service, of which such benefits as convenience and pleasantness are partially requested in the rural region, has already been attempted in Bangladesh.

However, in the region where all existing wells have been polluted by arsenic, after all, planning such a water service invites the result of the weak omission. It is not possible to hope for the improvement of public health, which is the first purpose of water service. The first step to the solution of the arsenic pollution problem is securing an arsenic-safe water source (for drinking and cooking) that can be accessed at an allowable distance.

In the master plan, from the well distribution situation in the rural region, it is judged that it is technically and economically advantageous to dig a lot of wells (level 1) to transport water from one well by pipe, and to construct a public stand post which does not change present water fetching work (level 2). However, this selection is a matter that affects the willingness and ability to pay as well as the user's maintenance cost, and should be decided by the residents.

Recommendation of Water Supply System in Rural Area in Master Plan

It was shown that the JICA Study Team executed the arsenic pollution realities, the survey of arsenic safe groundwater development, and the social survey etc. of the target three districts, and the arsenic safe deep groundwater development in the southern area was promising. And, among urgent regions, groundwater development in Kesabpur Thana region proposes to be high priority. Water-supplying plans propose facilities in the level 2 system where a life pattern should not be changed.

Outline of Plan

- Target water quality: As 0.01mg/l or less (deep underground water), 0.05mg/l (treatment facilities).

- Water consumption: 35lcd (for drinking and cooking) Production well: 6" and 300m in depth.
- Overhead tank: Capacity 30 to 50m^3 and 10 to 15m in height.
- Distribution pipe.
- Public stand post.

However, the success or failure depends on whether the maintenance system can be constructed as already described.

3) Comparison of Three Systems

Tables 7.2.7 and 7.2.9 to compare the cost of construction and the maintenance expense of the system that can be adopted in rural area. Level 1 is the highest, and level 2 is cheapest for the construction cost. As for the maintenance expense, level 1 is reversely cheapest, and level 2 has risen to the most. Because the population supplied by level 1 and level 2 is different, Kesabpur is different from the others. As for willingness to pay, there were a lot of answers of 30 Tk per household for one month according to the social survey result, though there was an answer as high as 300 Tk, too. On the other hand, the upper bound of the amount of the load is said generally up to 3% of the income. The upper bound of the amount of this local water service is 92 Tk/month/household based on this judgment.

It is not possible to improve public health if the cost of the water service is the one that low-income people intend to pay. Their willingness to pay might double by campaigning for community participation, and level 2 facilities might be possible depending on the Mouza. However, the first step in solving the arsenic problem is based on securing an arsenic safe water source at an appropriate access distance, and the level 1 water service facilities is expected to be planned. A part of Kesabpur and Altapor is expected to be improved level 1.

7.2 Design Criteria

7.2.1 Water Supply Area

The total area of the 16 mouzas is 27.66km^2.

7.2.2 Water Supplied Population and Water Consumption

The total population of the 16 mouzas was 35,890 people (year 2001). The target year for the project is 2010 and based on Jessore District population statistics from 1981 to 1991 (According to P/R Chapter 8.4 there is a 1.74% increase/year.).

Furthermore, the unit of water consumption is set at 35lcd.

Table 7.2.1 Water Consumption for 16 Mouza

Mouza	Area (Km^2)	Population		Water consumption (m^3/day)
		2001	2010	
Ramlhandrapur	1.9588	1,359	1,587	55.55
Byasdanga	1.2272	1,118	1,306	45.70
Brahmakati	1.4967	1,448	1,691	59.19
Khatiakhali	0.7047	895	1,045	36.59
Maguradanga	1.3425	1,303	1,522	53.26
Baliadanga	1.8232	2,907	3,395	118.83
Sujapur	1.4821	1,373	1,604	56.13
Altapol	5.0479	8,702	10,164	355.72
Sarfabad	0.8016	519	606	21.22
Bajitpur	0.7332	1,142	1,334	46.68
Sabdia	1.1650	1,720	2,009	70.31
Kesabpur	0.4184	1,512	1,766	61.81
Madhyakul	3.0448	3,485	4,070	142.46
Habaspol	0.8185	1,107	1,293	45.25
Bhagati Narendrapur	3.1694	4,153	4,851	169.77
Rajnagar Bankabarsi	2.4255	1,941	2,267	79.34
Total	27.6595	34,684	40,509	1,417.83
Average	***	2,168	2,532	88.61

7.2.3 Water Supply Facility

1) Level 2 Water Supply Facility

According to the result of the Supplementary survey, level 2 facilities will be planned as follows:

- Production Well Specifications

  Drilling works will be carried out by machine to secure sealing.

  Diameter:6”

  Depth: 350m

  Casing: Steel pipe

  Screen: Johnson stainless steel screen

- Pump (including control panel)

  If the suction level inside the well is GL -30m and the discharge level is the water tower’s high water level of GL +10m, the actual pump head is 40m. According to the result of the Supplementary survey, the potential of groundwater development ability is 70l/min per one well. If operating hours are 24 hours a day, the pumping volume is 100.8m^3/day; and it will be operated by public electricity.

  Pump Specifications

  Actual pump head: 40m

  Pumping volume: 83l/min or more

  Pump design: Multi-stage submersible motor pump

  Output: 2.2KW

Total head: 42m

- Water Tower

  If the required water capacity is 30% of the estimated water consumption (100.8 m^3/day), than it is 30.2m^2. Therefore, one water tower with a capacity of 35m^2 will be set up. The water tower will be 12m above ground level. It will be constructed of reinforced concrete. The bearing force of the soil is presumed to be 6.0t/m^2 and the ground will be the direct base of the tower.

- Operation House

  The Operation House consists of an office (4m x 4m) and storage (4m x 3m).

- Piping Design

  PVC pipes with a diameter of ϕ100 and 75mm will be used for all the distributing pipes. The main line and the end of the feeder line should be able to secure a minimum water pressure of 5.0m (0.5kg/cm^2).

- Public Faucet

  A ϕ13mm faucet has a discharge volume of 20l/min (9.6m^3/8hr). Moreover, the distributing system is installed so that it is less than 50m from the water source.

Table 7.2.2 Required Water Supply System (Level 2)

Mouza	Motor Pump	Distribution Pipe		Public Faucet
		100mm	75mm	
Ramlhandrapur	1	2,388.57	3,428.57	196
Byasdanga	1	1,782.86	1,257.14	123
Brahmakati	1	1,485.71	1,257.14	150
Khatiakhali	1	2,057.14	457.14	71
Maguradanga	1	2,297.14	571.43	135
Baliadanga	2	1,987.50	4,287.50	183
Sujapur	1	1,257.14	3,219.43	149
Altapol	4	10,250.00	10,550.00	505
Sarfabad	1	788.57	1,520.00	81
Bajitpur	1	1,085.71	434.29	74
Sabdia	1	1,600.00	1,702.86	117
Kesabpur	1	1,714.29	1,142.86	42
Madhyakul	2	5,490.20	4,235.30	305
Habaspol	1	628.57	1,314.29	82
Bhagati Narendrapur	2	4,690.20	3,764.71	317
Rajnagar Bankabarsi	1	1,300.00	3,671.43	243
Total	22	40,803.60	42,814.09	2,773

2) Level 1 Water Supply Facility

According to the result of the Supplementary survey, the level 1 facility will be planned as follows:

- Production Well Specifications

  Diameter:3”

Depth: 350m

Casing: PVC pipe

Screen: PVC screen

- Pump

The TARA pump which is used in Bangladesh will be adopted. The TARA pump's lifting ability changes according to the permeability coefficient of the aquifer and the groundwater level. If the estimated lifting volume is 13.5l/min (50% of the lifting capacity) and the operation hours of the pump are set at 8 hours, the estimated lifting volume per TARA pump is 6.5m^3/day. If standard water consumption is 35 lpcd, each hand pump will supply a population of 185 people.

Table 7.2.3 Required Water Supply System (Level 1)

Mouza	Hand Pump
Ramlhandrapur	8
Byasdanga	7
Brahmakati	9
Khatiakhali	5
Maguradanga	8
Baliadanga	18
Sujapur	8
Altapol	54
Sarfabad	3
Bajitpur	7
Sabdia	10
Kesabpur	9
Madhyakul	22
Habaspol	6
Bhagati Narendrapur	26
Rajnagar Bankabarsi	12
Total	212

3) Improved Level 1 Water Supply Facility

According to the result of Supplementary survey, in 2 mouzas (Altapol and Keshabpur), it may divide into urban and rural areas. In urban area, it is very difficult to construct several facilities, because land space is not enough. Therefore "improved level 1" facility will be planned in urban area. The other area in same mouzas and 14 mouzas will be planned same as level 1 facility (hand pump).

a. Improved Level 1 (Urban Area)

Basic specifications of the Improved Level 1 will be the same as the level 2 facility. However, distribution pipes will not be constructed; pumped-up water goes directly to public faucets from the water tower.

- Production Well Specifications

The same specifications as the level 2 water supply facility.

- Pump (including control panel)

  The same specifications as the level 2 water supply facility.

- Water Tower

  The same specifications as the level 2 water supply facility, except it will be 3m above ground level.

- Public faucet

  The same specifications as the level 2 water supply facility.

b. Level 1 (the Other Area)

It will be a water supply system with hand pumps.

Table 7.2.4 Required water Supply System by Improved Level 1

Mouza	Level 1	Improved Level 1	
	Hand Pump	Motor Pump	Public Faucet
Ramlhandrapur	8	0	0
Byasdanga	7	0	0
Brahmakati	9	0	0
Khatiakhali	5	0	0
Maguradanga	8	0	0
Baliadanga	18	0	0
Sujapur	8	0	0
Altapol	28	2	18
Sarfabad	3	0	0
Bajitpur	7	0	0
Sabdia	10	0	0
Kesabpur	3	1	3
Madhyakul	22	0	0
Habaspol	6	0	0
Bhagati Narendrapur	26	0	0
Rajnagar Bankabarsi	12	0	0
Total	180	3	21

7.2.4 Total Project Outlay

1) Public Education

The cost for public education is as follows:

Table 7.2.5 Public Education

Item	Per Mouza	16 Mouzas
1. Labor (4 persons x 5 days)	20,000	320,000
2. Vehicle (1 vehicle x 5 days)	10,000	160,000
3. Teaching materials (for 5 days)	50,000	800,000
Subtotal	80,000	1,280,000
4. Miscellaneous (20%)	16,000	256,000
Subtotal	96,000	1,536,000
5. Supervision (20%)	19,200	307,200
Total	115,200	1,843,200

UNIT: TAKA

2) Capacity Building

The cost of capacity building is as follows:

Table 7.2.6 Capacity Building

Item	Per session	Total (4 times)	Per Mouza	16 Mouzas
1. Labor (1 person x 5 subjects x 2 days)	10,000	40,000	2,500	40,000
2. Labor (1 lecturer x 5 subjects x 2 days)	10,000	40,000	2,500	40,000
3. Accommodations (5 persons x 2 days)	10,000	40,000	2,500	40,000
4. Transportation (5 persons)	5,000	20,000	1,250	20,000
5. Teaching materials (5 subjects)	50,000	200,000	12,500	200,000
Subtotal	85,000	340,000	21,250	340,000
6. Miscellaneous (20%)	17,000	68,000	4,250	68,000
Subtotal	102,000	408,000	25,500	408,000
7. Supervision (20%)	20,400	81,600	5,100	81,600
Total	122,400	489,600	30,600	489,600

UNIT: TAKA

3) Construction Cost

Construction costs have been calculated based on “Schedule of Rates, Public Works Department (Ninth Edition, First Revision, November, 1997)” and “Analysis of rate (ditto)”. The overhead cost was calculated to be 20% of each construction cost.

Table 7.2.7 Construction Cost

Mouza	Level 2	Level 1	Improved Level 1
Ramlhandrapur	4,776,254	3,773,635	3,773,635
Byasdanga	3,834,591	3,301,930	3,301,930
Brahmakati	3,806,853	4,245,339	4,245,339
Khatiakhali	3,576,823	2,358,522	2,358,522
Maguradanga	3,813,945	3,773,635	3,773,635
Baliadanga	7,583,440	8,490,679	8,490,679
Sujapur	4,293,063	3,773,635	3,773,635
Altapol	17,818,041	25,472,037	18,111,693
Sarfabad	3,534,549	1,415,113	1,415,113
Bajitpur	3,298,381	3,301,930	3,301,930
Sabdia	3,895,233	4,717,044	4,717,044
Kesabpur	3,610,448	4,245,339	4,168,039
Madhyakul	8,831,860	10,377,496	10,377,496
Habaspol	3,432,765	2,830,226	2,830,226
Bhagati Narendrapur	8,495,311	12,264,314	12,264,314
Rajnagar Bankabarsi	4,632,801	5,660,452	5,660,452
Total	89,234,358	100,001,326	92,563,682

Unit: TAKA

4) Total Project Outlay

The total project outlay is as follows:

Table 7.2.8 Total Project Outlay Level 2 Water Supply Facility

Mouza	(1) Public education	(2) Capacity building	(3) Construction cost	Total project outlay	
				per Mouza	per Person
Ramlhandrapur	115,200	30,600	4,776,254	4,922,054	3,101
Byasdanga	115,200	30,600	3,834,591	3,980,391	3,048
Brahmakati	115,200	30,600	3,806,853	3,952,653	2,337
Khatiakhali	115,200	30,600	3,576,823	3,722,623	3,561
Maguradanga	115,200	30,600	3,813,945	3,959,745	2,602
Baliadanga	115,200	30,600	7,583,440	7,729,240	2,276
Sujapur	115,200	30,600	4,293,063	4,438,863	2,768
Altapol	115,200	30,600	17,818,041	17,963,841	1,767
Sarfabad	115,200	30,600	3,534,549	3,680,349	6,072
Bajitpur	115,200	30,600	3,298,381	3,444,181	2,582
Sabdia	115,200	30,600	3,895,233	4,041,033	2,012
Kesabpur	115,200	30,600	3,610,448	3,756,248	2,127
Madhyakul	115,200	30,600	8,831,860	8,977,660	2,206
Habaspol	115,200	30,600	3,432,765	3,578,565	2,768
B. Narendrapur	115,200	30,600	8,495,311	8,641,111	1,781
R. Bankabarsi	115,200	30,600	4,632,801	4,778,601	2,108
Total	1,843,200	489,600	89,234,358	91,567,158	***

Level 1 Water Supply Facility

Mouza	(1) Public education	(2) Capacity building	(3) Construction cost	Total project outlay	
				Per Mouza	per Person
Ramlhandrapur	115,200	30,600	3,773,635	3,919,435	2,469
Byasdanga	115,200	30,600	3,301,930	3,447,730	2,640
Brahmakati	115,200	30,600	4,245,339	4,391,139	2,596
Khatiakhali	115,200	30,600	2,358,522	2,504,322	2,396
Maguradanga	115,200	30,600	3,773,635	3,919,435	2,575
Baliadanga	115,200	30,600	8,490,679	8,636,479	2,544
Sujapur	115,200	30,600	3,773,635	3,919,435	2,444
Altapol	115,200	30,600	25,472,037	25,617,837	2,521
Sarfabad	115,200	30,600	1,415,113	1,560,913	2,575
Bajitpur	115,200	30,600	3,301,930	3,447,730	2,585
Sabdia	115,200	30,600	4,717,044	4,862,844	2,421
Kesabpur	115,200	30,600	4,245,339	4,391,139	2,487
Madhyakul	115,200	30,600	10,377,496	10,523,296	2,585
Habaspol	115,200	30,600	2,830,226	2,976,026	2,302
B. Narendrapur	115,200	30,600	12,264,314	12,410,114	2,559
R. Bankabarsi	115,200	30,600	5,660,452	5,806,252	2,561
Total	1,843,200	489,600	100,001,326	102,334,126	***

Improved Level 1 Water Supply Facility

Mouza	(1) Public education	(2) Capacity building	(3) Construction cost	Total project outlay	
				per Mouza	per Person
Ramlhandrapur	115,200	30,600	3,773,635	3,919,435	2,469
Byasdanga	115,200	30,600	3,301,930	3,447,730	2,640
Brahmakati	115,200	30,600	4,245,339	4,391,139	2,596
Khatiakhali	115,200	30,600	2,358,522	2,504,322	2,396
Maguradanga	115,200	30,600	3,773,635	3,919,435	2,575
Baliadanga	115,200	30,600	8,490,679	8,636,479	2,544
Sujapur	115,200	30,600	3,773,635	3,919,435	2,444
Altapol	115,200	30,600	18,111,693	18,257,493	1,796
Sarfabad	115,200	30,600	1,415,113	1,560,913	2,575
Bajitpur	115,200	30,600	3,301,930	3,447,730	2,585
Sabdia	115,200	30,600	4,717,044	4,862,844	2,421
Kesabpur	115,200	30,600	4,168,039	4,313,839	2,443
Madhyakul	115,200	30,600	10,377,496	10,523,296	2,585
Habaspol	115,200	30,600	2,830,226	2,976,026	2,302
B. Narendrapur	115,200	30,600	12,264,314	12,410,114	2,559
R. Bankabarsi	115,200	30,600	5,660,452	5,806,252	2,561
Total	1,843,200	489,600	92,563,682	94,896,482	***

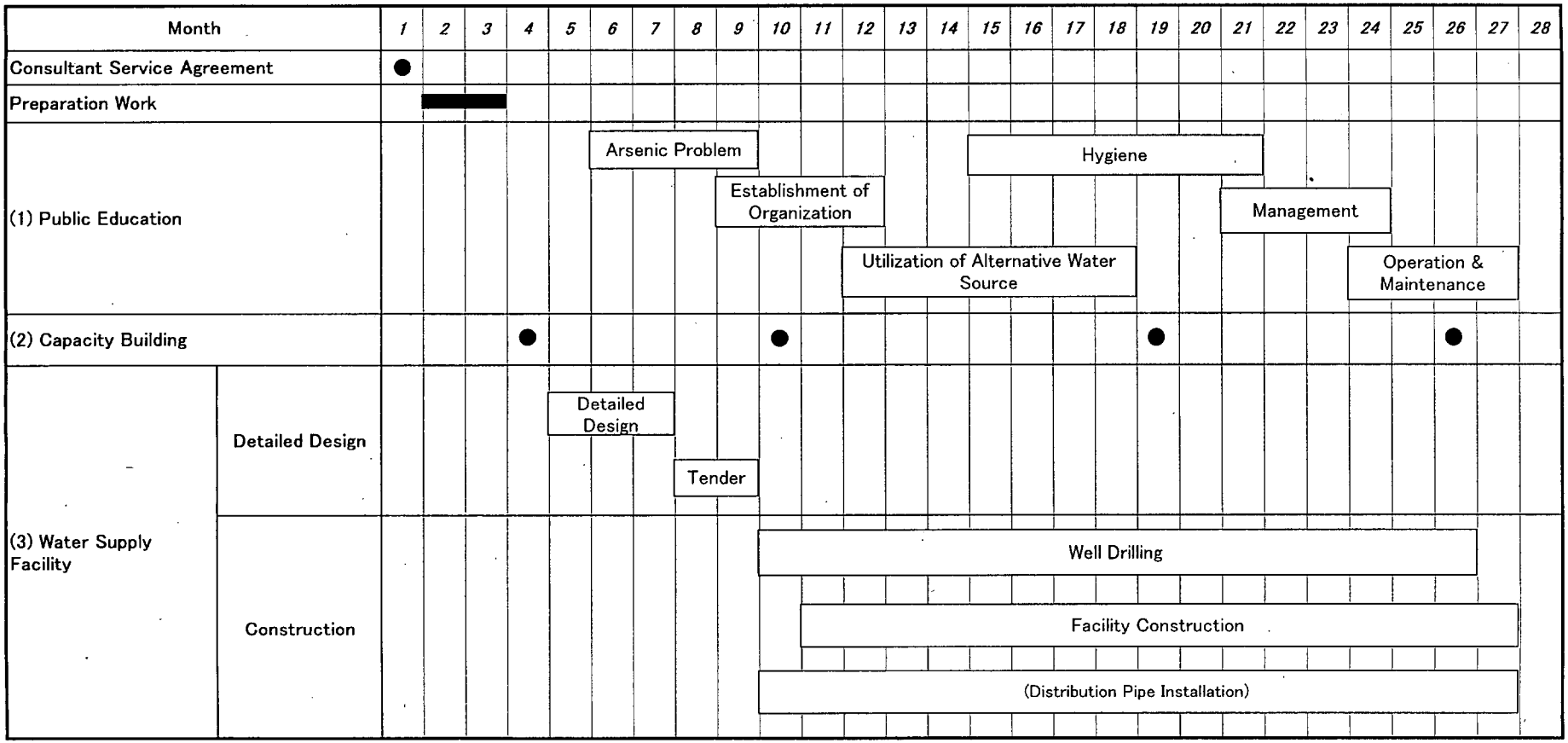
7.2.5 Implementation of the Project

Implementation of the Project is to be carried out by DPHE. DPHE will organize a steering committee (PMU) whose members will be full-time. In cooperation with consultants, PMU will supervise the implementation of the Project in liaison with DPHE's Jessore District office and the local office in Keshabpur.

The consultants will formulate a Detailed Design of the water supply facility. They will also be in charge of tendering and will prepare and submit the tenders. Moreover, as a soft component, educational activities in the concerned villages and capacity building will be conducted simultaneously with implementation of the Detailed Design.

The contractor should be selected based on the tenders and should construct the water supply facility and supply the equipment under the supervision of the consultants.

Project Impremantation Schedule



7.2.6 Operation and Maintenance Cost

The costs to operate and maintain the water supply facility per household and per $1m^3$ of water are as follows (see Tables 7.2.10 to 7.2.13 for detail):

Table 7.2.9 Operation & Maintenance Cost

per Household

Mouza	Level 2	Level 1	Improved Level 1	
Ramlhandrapur	158.66	15.74		15.74
Byasdanga	178.36	16.74		16.74
Brahmakati	137.77	16.62		16.62
Khatiakhali	217.55	14.94		14.94
Maguradanga	153.00	16.42		16.42
Baliadanga	136.25	16.56		16.56
Sujapur	151.15	15.58		15.58
Altapol	96.01	16.59	Urban area:	83.60
			Rural area:	16.84
Sarfabad	372.59	15.46		15.46
Bajitpur	166.76	16.39		16.39
Sabdia	117.10	15.55		15.55
Kesabpur	129.82	15.92	Urban area:	125.74
			Rural area:	13.26
Madhyakul	119.81	16.88		16.88
Habaspol	174.02	14.49		14.49
Bhagati Narendrapur	100.13	16.74		16.74
Rajnagar Bankabarsi	110.34	16.53		16.53
Average	128.86	16.34		27.43

UNIT: TAKA

per $1m^3$ Water

Mouza	Level 2	Level 1	Improved Level 1	
Ramlhandrapur	32.08	3.18		3.18
Byasdanga	36.06	3.39		3.39
Brahmakati	27.86	3.36		3.36
Khatiakhali	43.99	3.02		3.02
Maguradanga	30.94	3.32		3.32
Baliadanga	27.55	3.35		3.35
Sujapur	30.56	3.15		3.15
Altapol	19.41	3.36	Urban area:	16.91
			Rural area:	3.41
Sarfabad	75.34	3.13		3.13
Bajitpur	33.72	3.31		3.31
Sabdia	23.68	3.14		3.14
Kesabpur	26.25	3.22	Urban area:	25.43
			Rural area:	2.68
Madhyakul	24.23	3.41		3.41
Habaspol	35.19	2.93		2.93
Bhagati Narendrapur	20.25	3.39		3.39
Rajnagar Bankabarsi	22.31	3.34		3.34
Average	26.06	3.30		5.55

UNIT: TAKA

Table 7.2.10 Operation and Maintenance Cost (1/2)

Level 2

No.	Mauza	Population 2010	Water consumption (m^3)		O&M cost (per month)			
			per day	per month	Total	per person	per HH	per m^3
1	Ramlhandrapur	1,587	55.55	1,666.61	53,469.34	33.69	158.66	32.08
2	Byasdanga	1,306	45.70	1,371.06	49,446.82	37.87	178.36	36.06
3	Brahmakati	1,691	59.19	1,775.76	49,466.72	29.25	137.77	27.86
4	Khatiakhali	1,045	36.59	1,097.58	48,281.66	46.19	217.55	43.99
5	Maguradanga	1,522	53.26	1,597.94	49,436.45	32.48	153.00	30.94
6	Baliadanga	3,395	118.83	3,565.00	98,217.77	28.93	136.25	27.55
7	Sujapur	1,604	56.13	1,683.78	51,462.06	32.09	151.15	30.56
8	Altapol	10,164	355.72	10,671.71	207,182.51	20.38	96.01	19.41
9	Sarfabad	606	21.22	636.48	47,951.96	79.11	372.59	75.34
10	Bajitpur	1,334	46.68	1,400.49	47,222.63	35.40	166.76	33.72
11	Sabdia	2,009	70.31	2,109.32	49,945.91	24.86	117.10	23.68
12	Kesabpur	1,766	61.81	1,854.24	48,674.88	27.56	129.82	26.25
13	Madhyakul	4,070	142.46	4,273.83	103,536.91	25.44	119.81	24.23
14	Habaspol	1,293	45.25	1,357.57	47,768.32	36.95	174.02	35.19
15	Bhagati Narendrapur	4,851	169.77	5,093.04	103,120.28	21.26	100.13	20.25
16	Rajnagar Bankabars	2,267	79.34	2,380.35	53,109.25	23.43	110.34	22.31
Total		40,509	1,417.83	42,534.77	1,108,293.46	***	***	***
Average		2,532	88.61	2,658.42	69,268.34	27.36	128.86	26.06

Level 1

No.	Mauza	Population 2010	Water consumption (m^3)		O&M cost (per month)			
			per day	per month	Total	per person	per HH	per m^3
1	Ramlhandrapur	1,587	55.55	1,666.61	5,304.67	3.34	15.74	3.18
2	Byasdanga	1,306	45.70	1,371.06	4,641.58	3.55	16.74	3.39
3	Brahmakati	1,691	59.19	1,775.76	5,967.75	3.53	16.62	3.36
4	Khatiakhali	1,045	36.59	1,097.58	3,315.42	3.17	14.94	3.02
5	Maguradanga	1,522	53.26	1,597.94	5,304.67	3.49	16.42	3.32
6	Baliadanga	3,395	118.83	3,565.00	11,935.50	3.52	16.56	3.35
7	Sujapur	1,604	56.13	1,683.78	5,304.67	3.31	15.58	3.15
8	Altapol	10,164	355.72	10,671.71	35,806.50	3.52	16.59	3.36
9	Sarfabad	606	21.22	636.48	1,989.25	3.28	15.46	3.13
10	Bajitpur	1,334	46.68	1,400.49	4,641.58	3.48	16.39	3.31
11	Sabdia	2,009	70.31	2,109.32	6,630.83	3.30	15.55	3.14
12	Kesabpur	1,766	61.81	1,854.24	5,967.75	3.38	15.92	3.22
13	Madhyakul	4,070	142.46	4,273.83	14,587.83	3.58	16.88	3.41
14	Habaspol	1,293	45.25	1,357.57	3,978.50	3.08	14.49	2.93
15	Bhagati Narendrapur	4,851	169.77	5,093.04	17,240.17	3.55	16.74	3.39
16	Rajnagar Bankabars	2,267	79.34	2,380.35	7,957.00	3.51	16.53	3.34
Total		40,509	1,417.83	42,534.77	140,573.67	***	***	***
Average		2,532	88.61	2,658.42	8,785.85	3.47	16.34	3.30

Improved Level 1

No.	Mauza	Population 2010	Water consumption (m^3) per day	Water consumption (m^3) per month	O&M cost (per month) Total	per person	per HH	per m^3
1	Ramlhandrapur	1,587	55.55	1,666.61	5,304.67	3.34	15.74	3.18
2	Byasdanga	1,306	45.70	1,371.06	4,641.58	3.55	16.74	3.39
3	Brahmakati	1,691	59.19	1,775.76	5,967.75	3.53	16.62	3.36
4	Khatiakhali	1,045	36.59	1,097.58	3,315.42	3.17	14.94	3.02
5	Maguradanga	1,522	53.26	1,597.94	5,304.67	3.49	16.42	3.32
6	Baliadanga	3,395	118.83	3,565.00	11,935.50	3.52	16.56	3.35
7	Sujapur	1,604	56.13	1,683.78	5,304.67	3.31	15.58	3.15
8	Altapol *	Urban 4,971	173.98	5,219.53	88,237.22	17.75	83.60	16.91
		Rural 5,193	181.74	5,452.18	18,566.33	3.58	16.84	3.41
		Total 10,164	355.72	10,671.71	106,803.55	***	***	***
9	Sarfabad	606	21.22	636.48	1,989.25	3.28	15.46	3.13
10	Bajitpur	1,334	46.68	1,400.49	4,641.58	3.48	16.39	3.31
11	Sabdia	2,009	70.31	2,109.32	6,630.83	3.30	15.55	3.14
12	Kesabpur *	Urban 1,060	37.08	1,112.55	28,287.48	26.70	125.74	25.43
		Rural 706	24.72	741.70	1,989.25	2.82	13.26	2.68
		Total 1,766	61.81	1854.24	30,276.73	***	***	***
13	Madhyakul	4,070	142.46	4,273.83	14,587.83	3.58	16.88	3.41
14	Habaspol	1,293	45.25	1,357.57	3,978.50	3.08	14.49	2.93
15	Bhagati Narendrapur	4,851	169.77	5,093.04	17,240.17	3.55	16.74	3.39
16	Rajnagar Bankabars	2,267	79.34	2,380.35	7,957.00	3.51	16.53	3.34
Total		40,509	1,417.83	42,534.77	235,879.70	***	***	***
Average		2,532	88.61	2,658.42	14,742.48	5.82	27.43	5.55

(*) : Upper column is the cost for Improved Level 1 water supply system. Center is Level 1 system.

Table 7.2.11 Operation and Maintenance Cost per each mouza (Level 2) (1/4)

1 Ramlhandrapur Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	5.56	100.00	555.54
3	Repair cost	0.4% of construction cost	unit	1.00	19,901.00	19,901.00
	Grand total					53,469.34

2 Byasdanga Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	4.57	100.00	457.02
3	Repair cost	0.4% of construction cost	unit	1.00	15,977.00	15,977.00
	Grand total					49,446.82

3 Brahmakati Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	5.92	100.00	591.92
3	Repair cost	0.4% of construction cost	unit	1.00	15,862.00	15,862.00
	Grand total					49,466.72

4 Khatiakhali Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	3.66	100.00	365.86
3	Repair cost	0.4% of construction cost	unit	1.00	14,903.00	14,903.00
	Grand total					48,281.66

5 Maguradanga Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	5.33	100.00	532.65
3	Repair cost	0.4% of construction cost	unit	1.00	15,891.00	15,891.00
	Grand total					49,436.45

6 Baliadanga Submersible pumps: 2.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	2.00	33,012.80	66,025.60
2	Breaching powder		kg	5.94	100.00	594.17
3	Repair cost	0.4% of construction cost	unit	1.00	31,598.00	31,598.00
	Grand total					98,217.77

7 Sujapur Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	5.61	100.00	561.26
3	Repair cost	0.4% of construction cost	unit	1.00	17,888.00	17,888.00
	Grand total					51,462.06

8 Altapol Submersible pumps: 4.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	4.00	33,012.80	132,051.20
2	Breaching powder		kg	8.89	100.00	889.31
3	Repair cost	0.4% of construction cost	unit	1.00	74,242.00	74,242.00
	Grand total					207,182.51

Table 7.2.11 Operation and Maintenance Cost per each mouza (Level 2) (3/4)

9 Sarfabad Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	2.12	100.00	212.16
3	Repair cost	0.4% of construction cost	unit	1.00	14,727.00	14,727.00
	Grand total					47,951.96

10 Bajitpur Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	4.67	100.00	466.83
3	Repair cost	0.4% of construction cost	unit	1.00	13,743.00	13,743.00
	Grand total					47,222.63

11 Sabdia Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	7.03	100.00	703.11
3	Repair cost	0.4% of construction cost	unit	1.00	16,230.00	16,230.00
	Grand total					49,945.91

12 Kesabpur Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	6.18	100.00	618.08
3	Repair cost	0.4% of construction cost	unit	1.00	15,044.00	15,044.00
	Grand total					48,674.88

13 Madhyakul Submersible pumps: 2.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	2.00	33,012.80	66,025.60
2	Breaching powder		kg	7.12	100.00	712.31
3	Repair cost	0.4% of construction cost	unit	1.00	36,799.00	36,799.00
	Grand total					103,536.91

14 Habaspol Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	4.53	100.00	452.52
3	Repair cost	0.4% of construction cost	unit	1.00	14,303.00	14,303.00
	Grand total					47,768.32

15 Bhagati Narendrapur Submersible pumps: 2.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	2.00	33,012.80	66,025.60
2	Breaching powder		kg	16.98	100.00	1,697.68
3	Repair cost	0.4% of construction cost	unit	1.00	35,397.00	35,397.00
	Grand total					103,120.28

16 Rajnagar Bankabarsi Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	1.00	33,012.80	33,012.80
2	Breaching powder		kg	7.93	100.00	793.45
3	Repair cost	0.4% of construction cost	unit	1.00	19,303.00	19,303.00
	Grand total					53,109.25

Table 7.2.12 Operation and maintenance Cost per each well (Level 1)

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Every year					
	Spare parts		set	1.00	550	550.00
	DPHE staff allowance		pers	2.00	1,000	2,000.00
	Patrol vehicle, fuel		day	1.00	1,250	1,250.00
2	Once per 3 years					
	Cleaning		times	0.30	8,000	2,400.00
	DPHE staff allowance		pers	0.60	1,000	600.00
	Patrol vehicle, fuel		days	0.30	1,250	375.00
3	Once per 10 years					
	Purchase of new pump		pumps	0.10	4,570	457.00
	DPHE staff allowance		pers	0.20	1,000	200.00
	Patrol vehicle, fuel		days	0.10	1,250	125.00
Grand total (per year)						7,957.00
Grand total (per month)						663.08

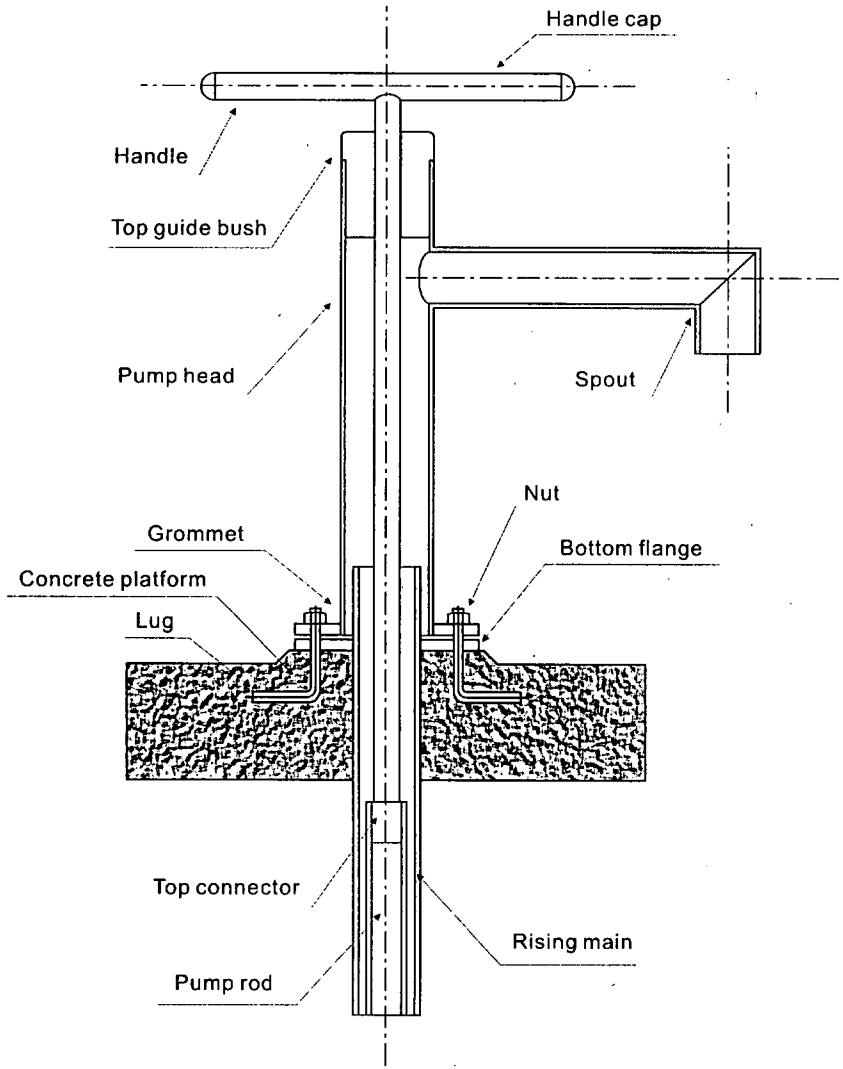
Table 7.2.13 Operation and Maintenance Cost for 2 mouza to be adopted Improved Level 1

8 Altapol Submersible pumps: 2.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	24 hours	unit	1,440.00	4.87	7,012.80
	Labor	2 pers/month X 2 shifts	pers	4.00	6,000.00	24,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					33,012.80
	Sub total		unit	2.00	33,012.80	66,025.60
2	Breaching powder		kg	17.79	100.00	1,778.62
3	Repair cost	0.4% of construction cost	unit	1.00	20,433.00	20,433.00
Grand total						88,237.22

12 Kesabpur Submersible pumps: 1.00 set

No.	Item	Spec.	Unit	Quantity	Unit price	Total
1	Running cost					
	Public electricity charge	12 hours	unit	720.00	4.87	3,506.40
	Labor	2 pers/month X 1 shifts	pers	2.00	6,000.00	12,000.00
	Office supplies		unit	1.00	1,000.00	1,000.00
	Miscellaneous		unit	1.00	1,000.00	1,000.00
	Sub total per facility					17,506.40
	Sub total		unit	1.00	17,506.40	17,506.40
2	Breaching powder		kg	6.18	100.00	618.08
3	Repair cost	0.4% of construction cost	unit	1.00	10,163.00	10,163.00
Grand total						28,287.48



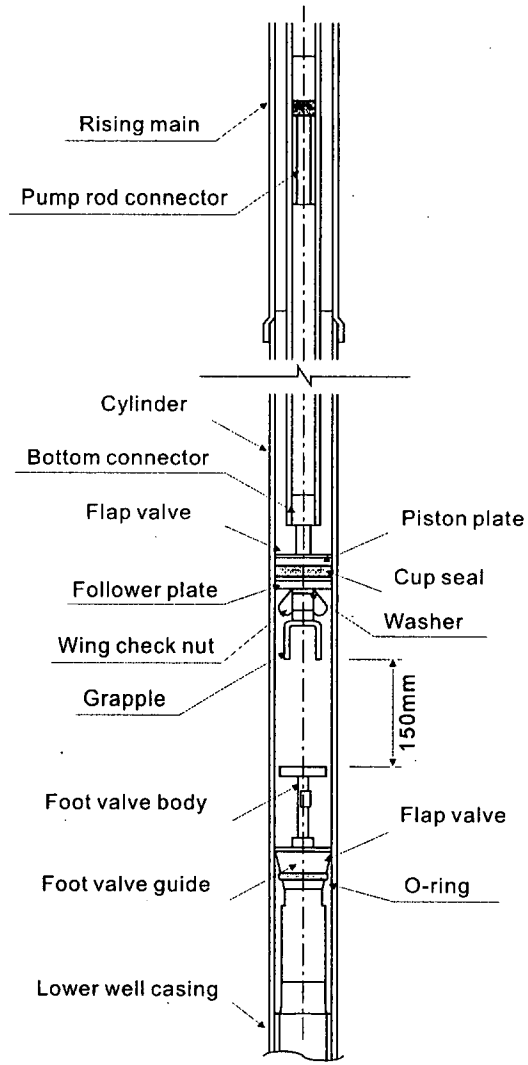
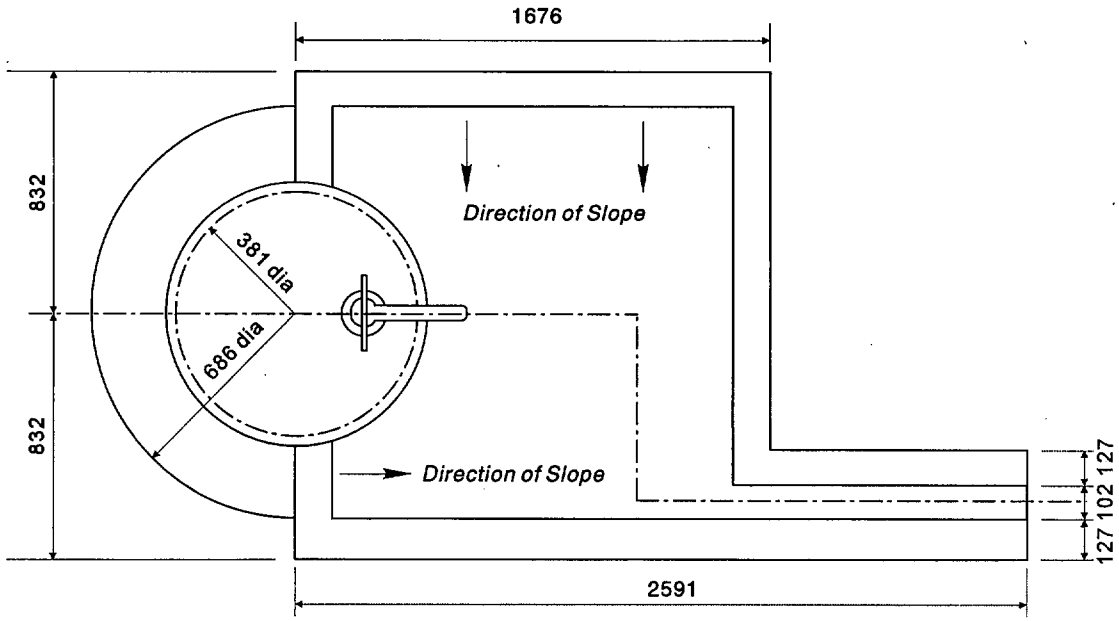


Figure 7.1 Hand Pump Structure (Level 1)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Plan



Section

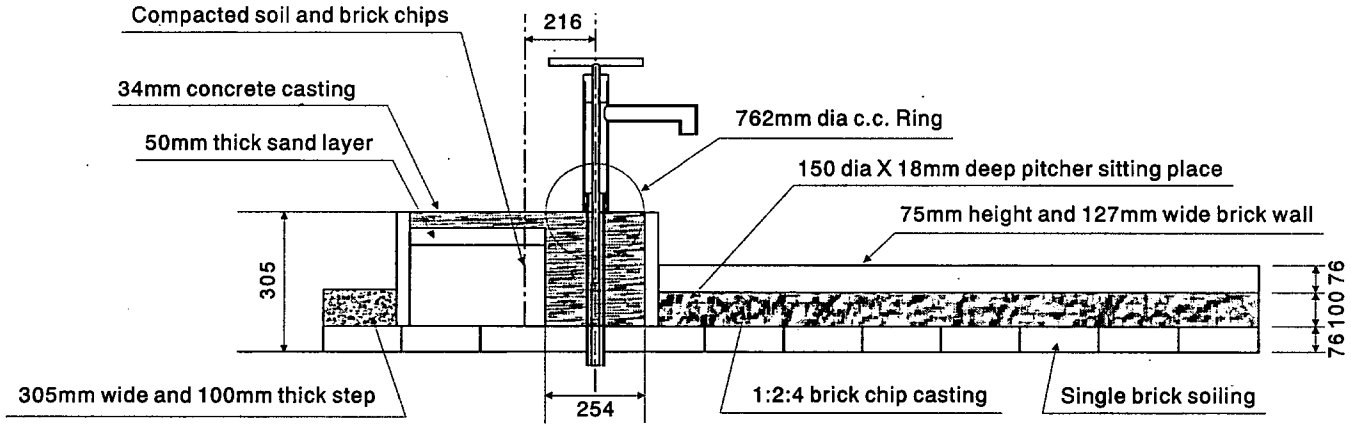


Figure 7.2	Hand Pump and Plat Form (Level 1)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

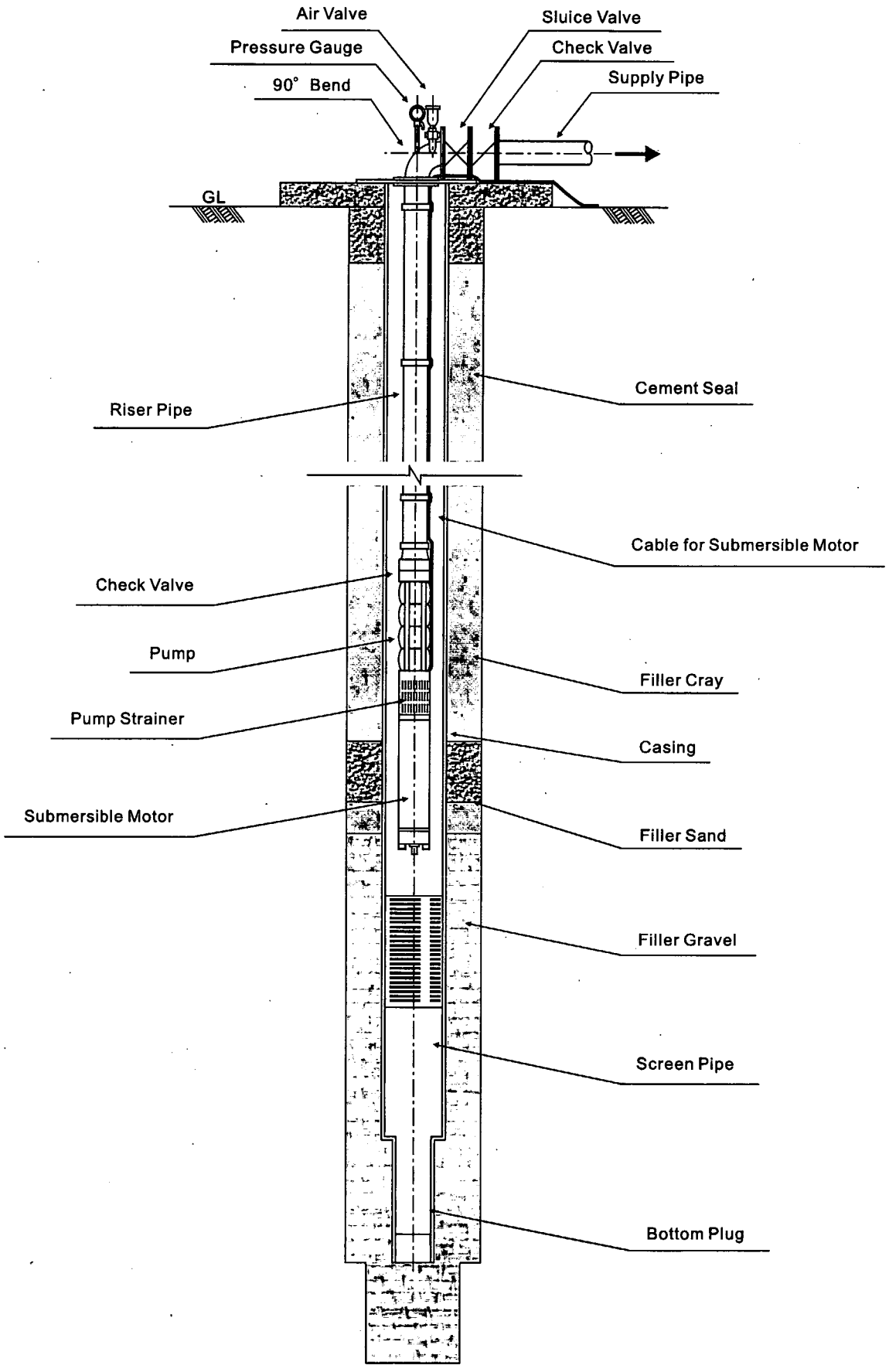


Figure 7.3	Submersible Pump Structure (Level 2 and Improved Level 1)
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

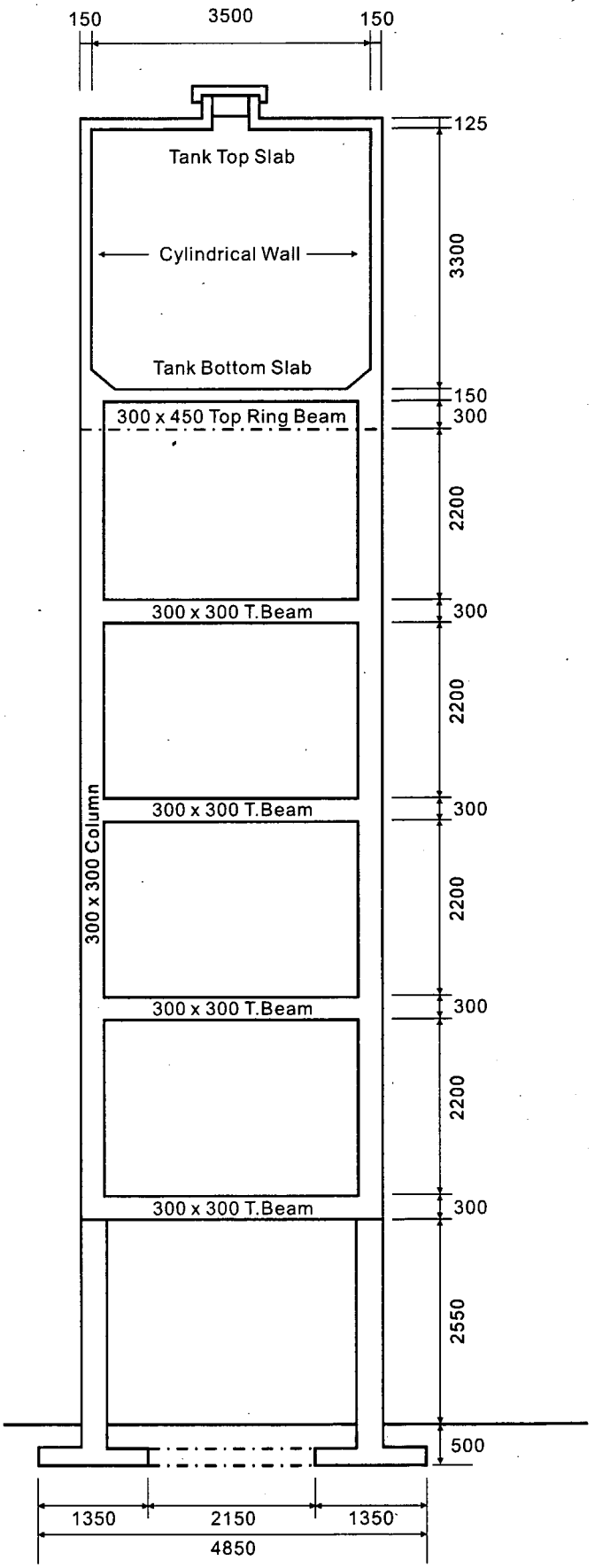
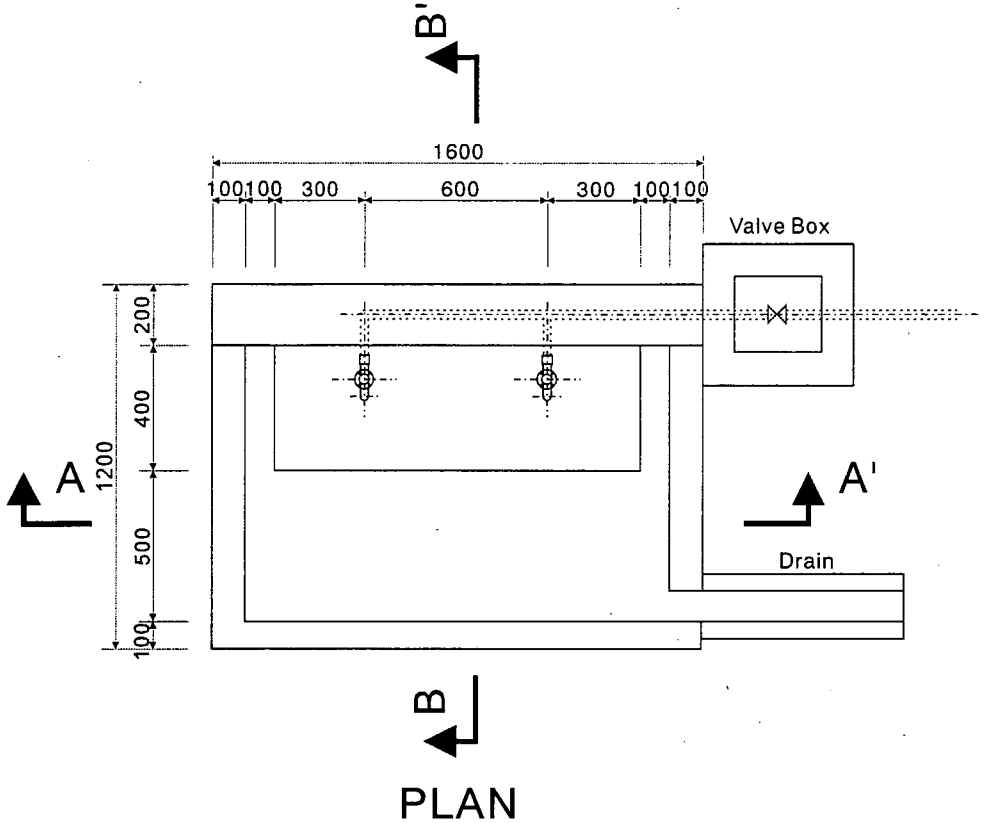
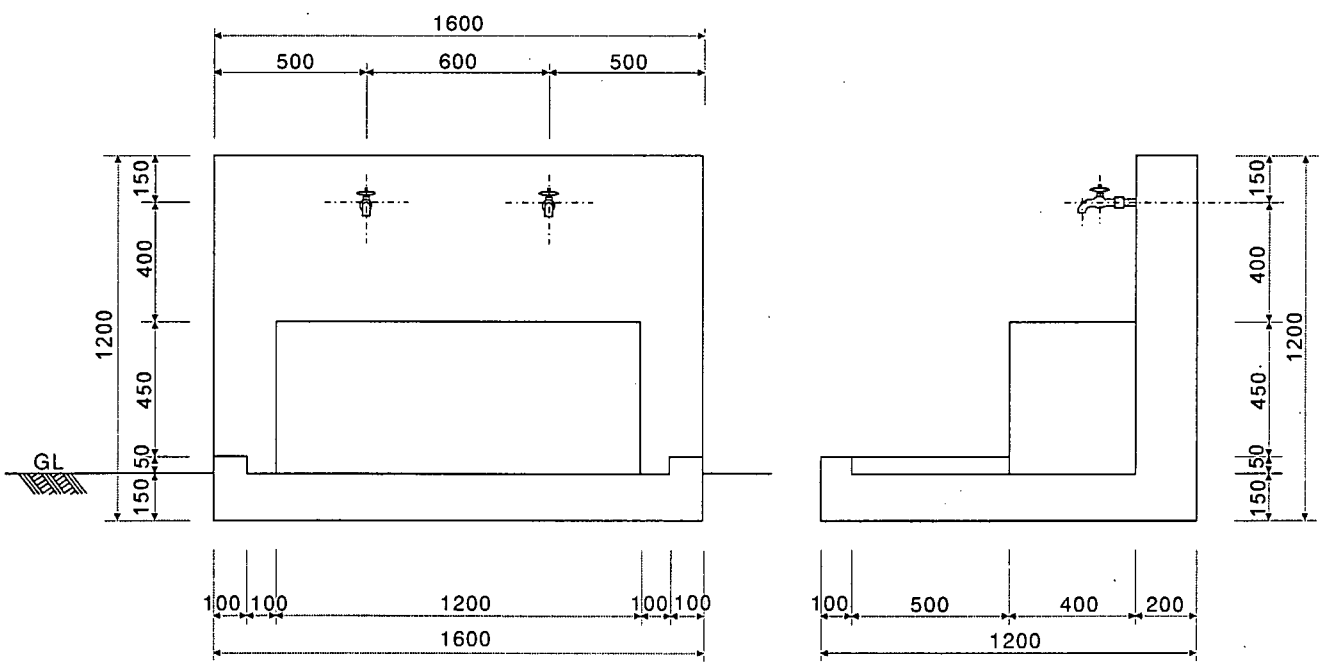


Figure 7.4	Water Tank (Level 2: H=12m, Improved Level 1: H=3m)
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

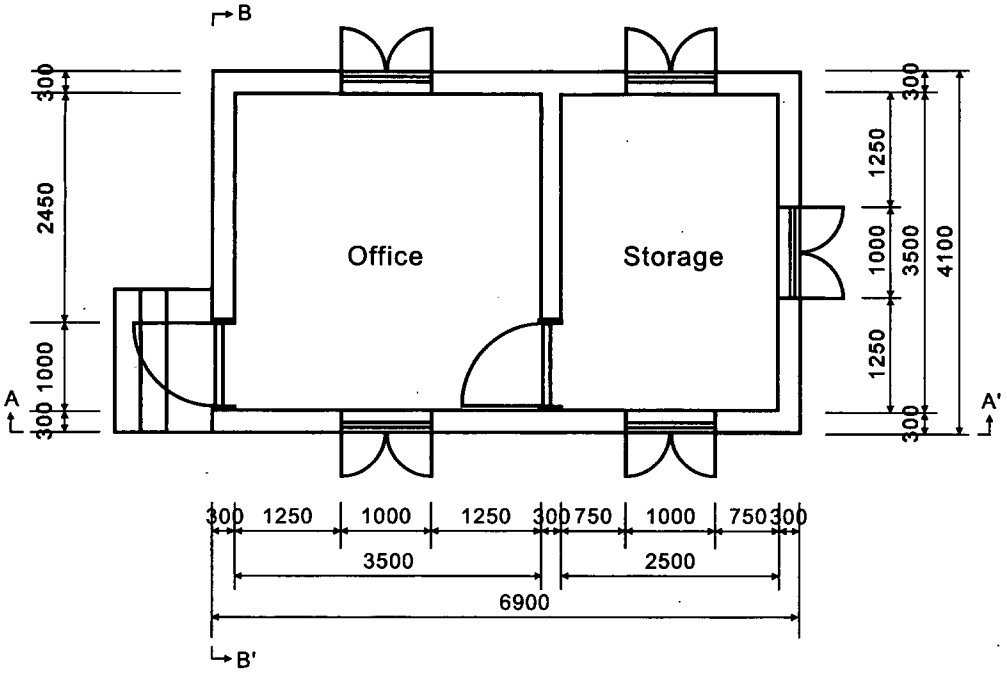


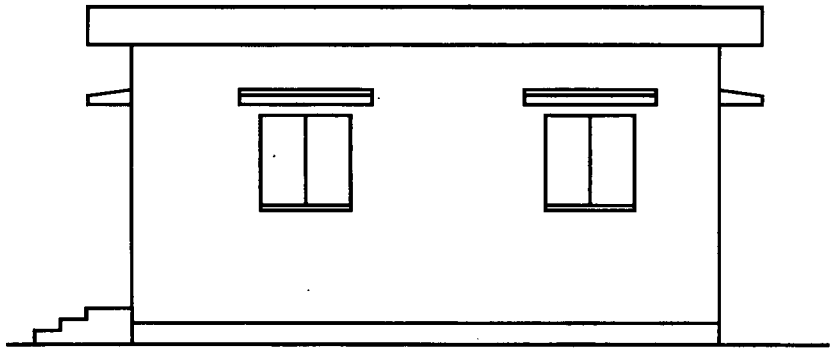


Section A-A'

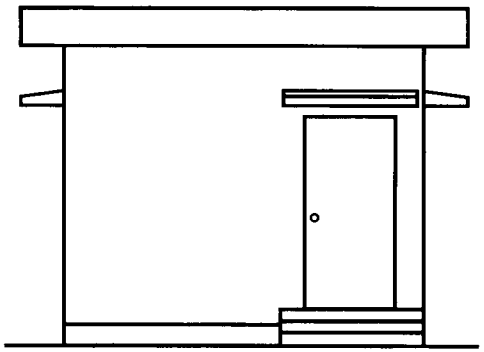
Section B-B'

Figure 7.5	Public Fauset (Level 2 and Improved Level 1)
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	





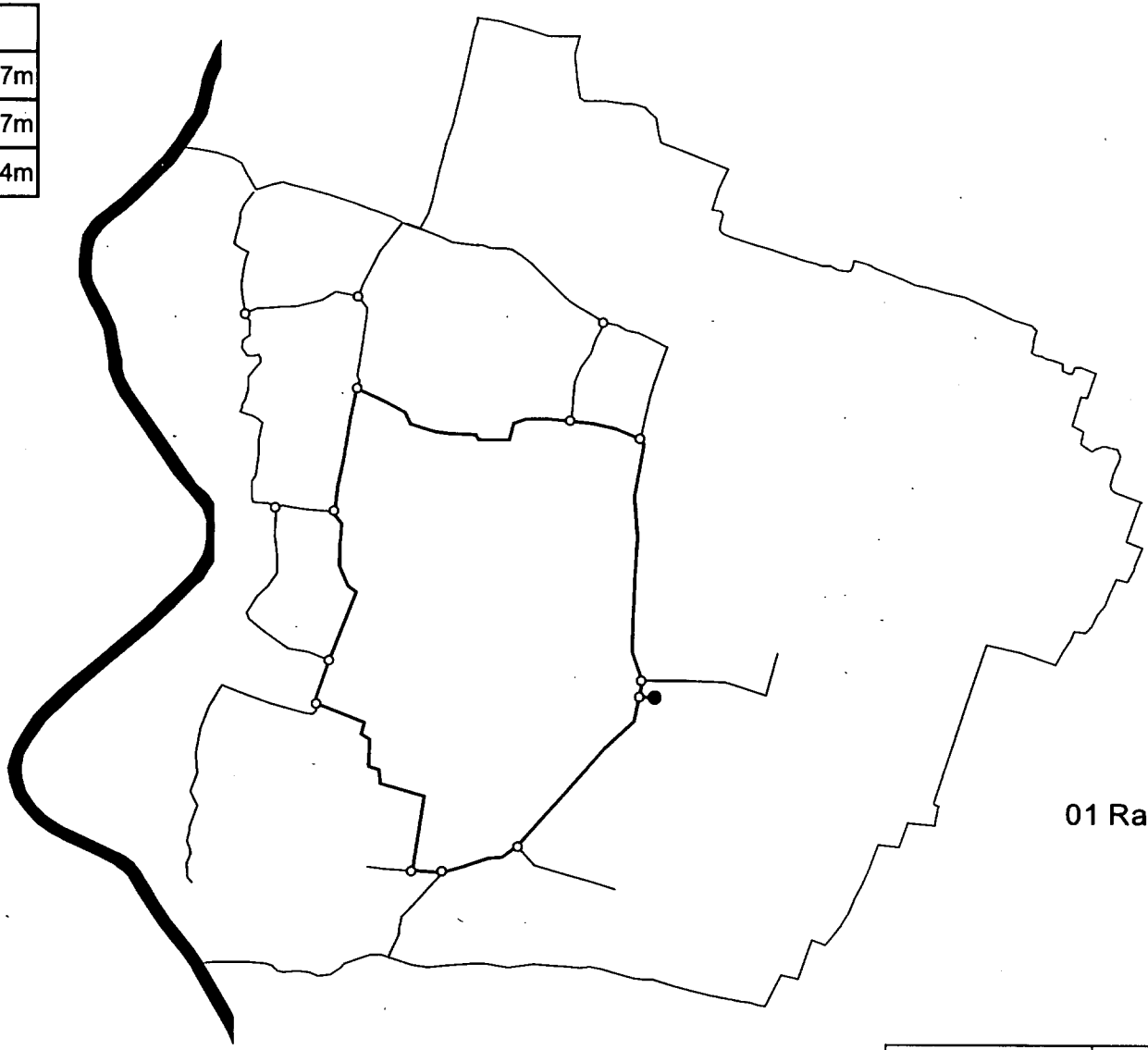
SECTION A-A'



SECTION B-B'

Figure 7.6	Operation House (Level 2 and Improved Level 1)
THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH	
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	

Distribution Pipe	
100mm	2,388.57m
75mm	3,428.57m
Total	5,817.14m



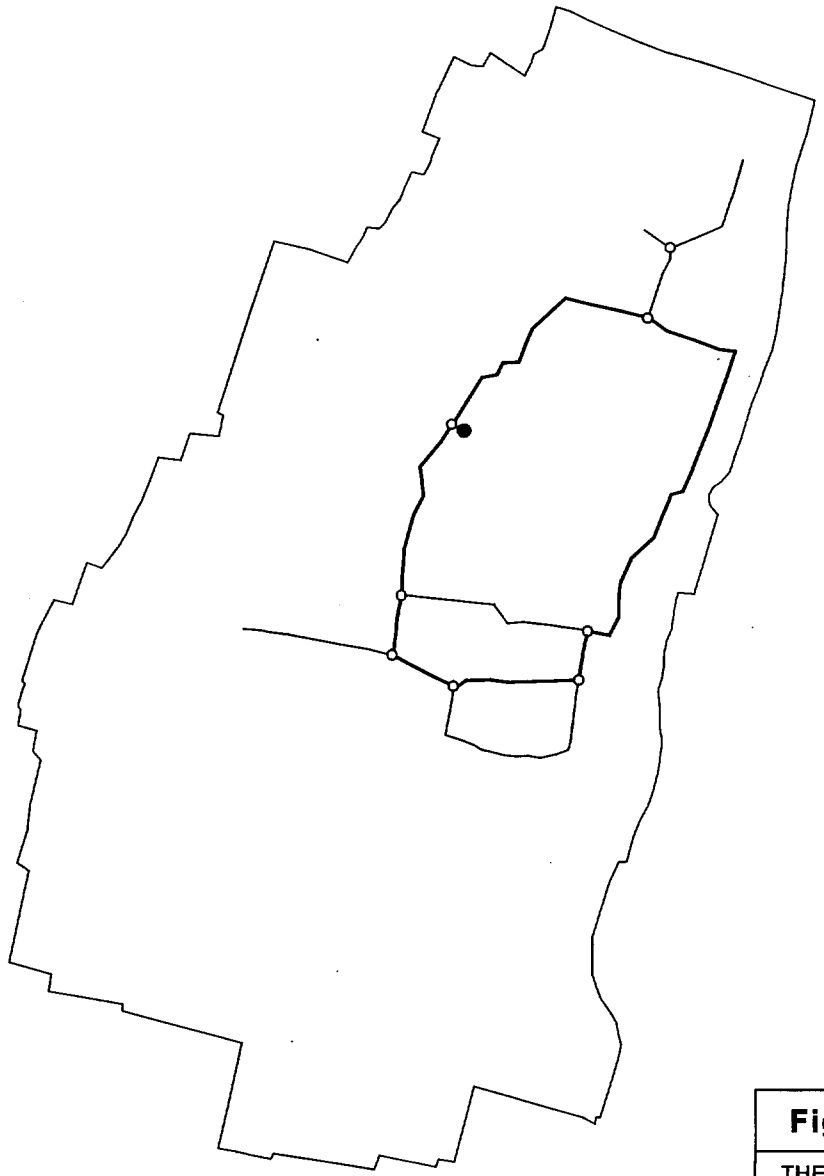
0 200 400 600 800 1000 Meters

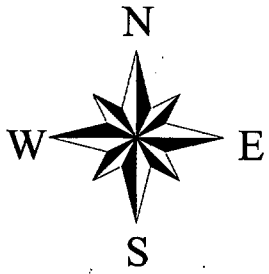
Figure 7.7 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,782.86m
75mm	1,257.14m
Total	3,040.00m





02 Byasdanga

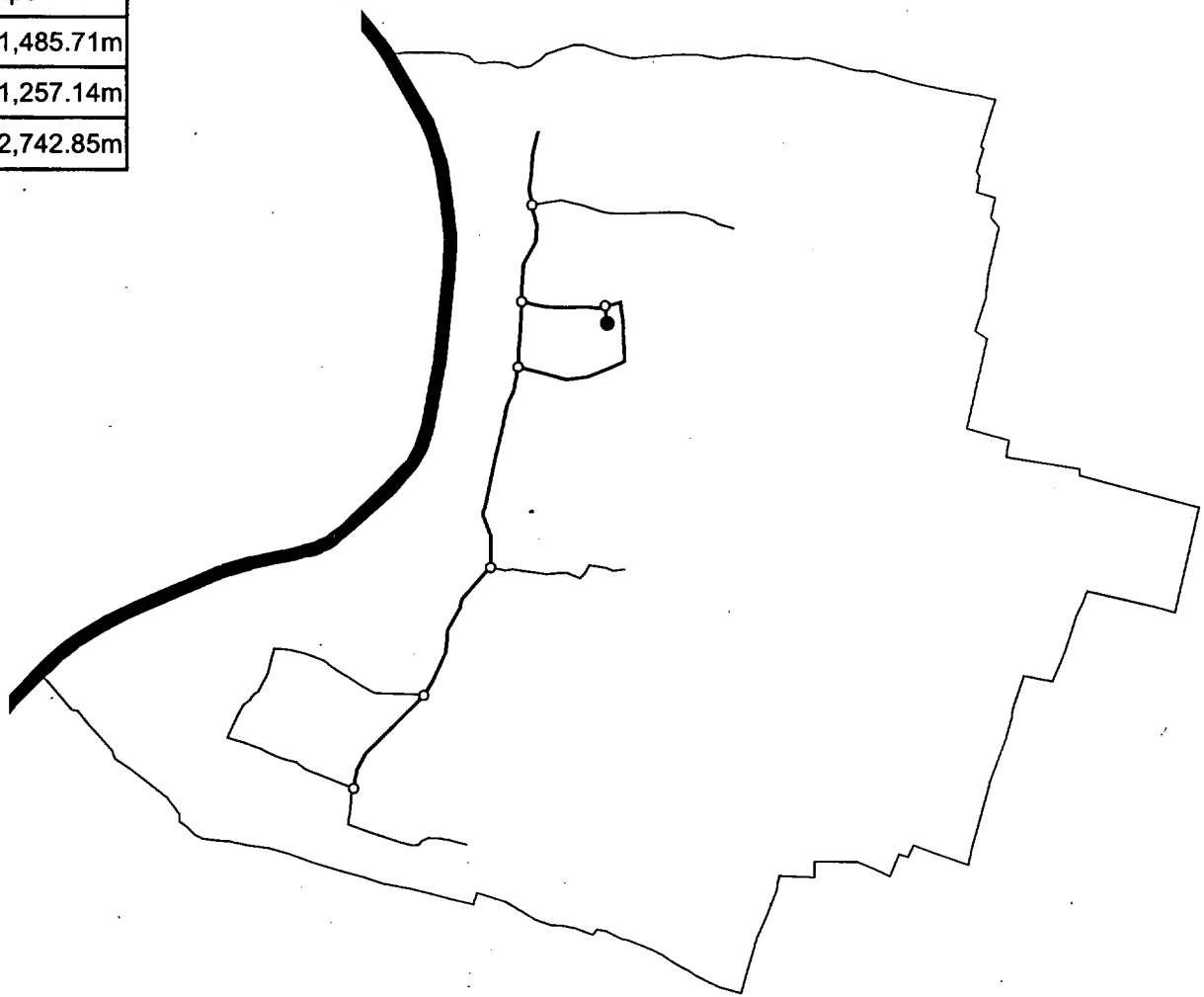
0 200 400 600 800 1000 Meters

Figure 7.8 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,485.71m
75mm	1,257.14m
Total	2,742.85m



N
W E
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03 Brahmakati

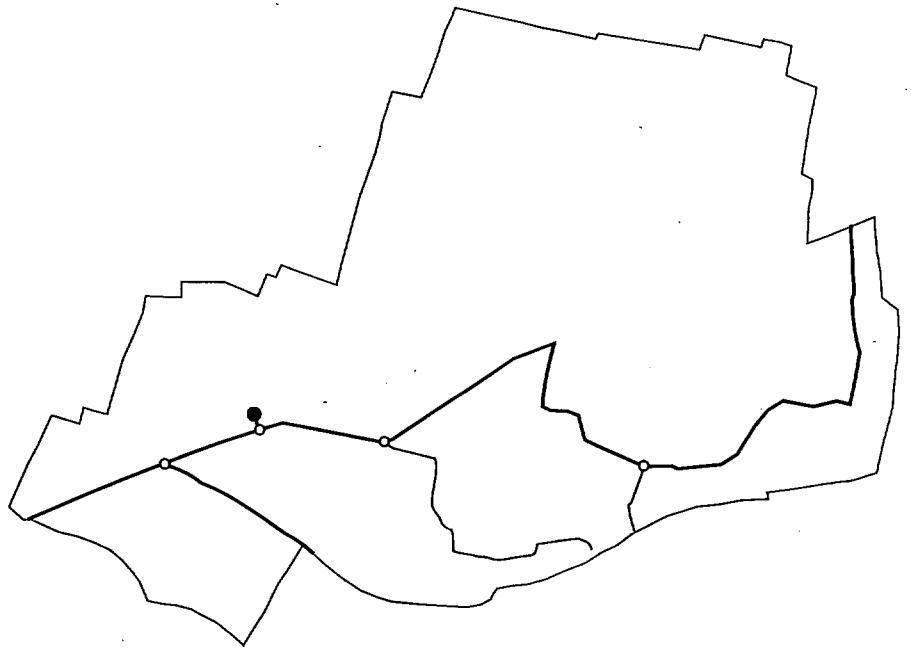
0 200 400 600 800 1000 Meters

Figure 7.9 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	2,057.14m
75mm	457.14m
Total	2,514.28m



N
W E
S

04 Khatiakhali

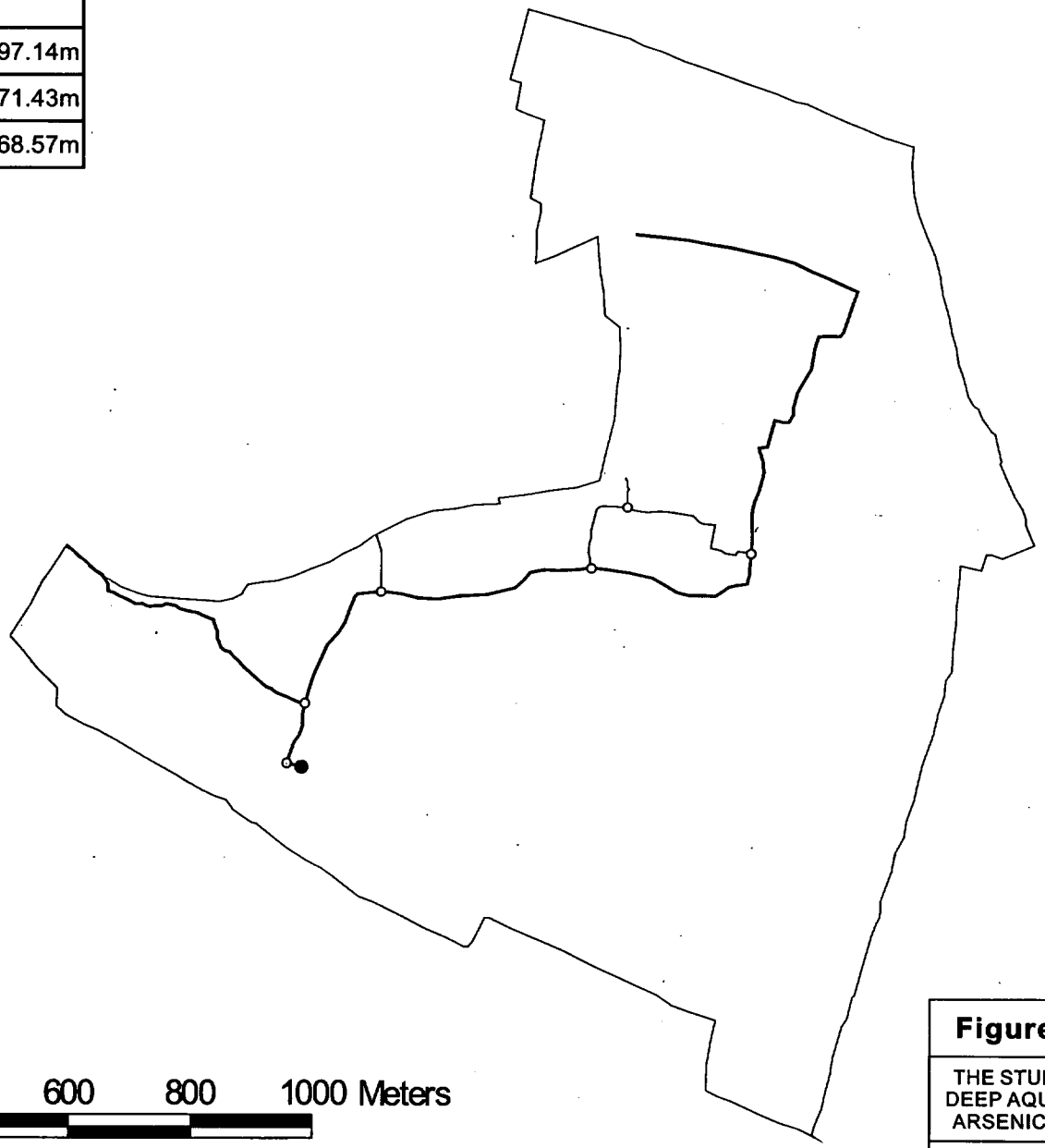
0 200 400 600 800 1000 Meters

Figure 7.10 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	2,297.14m
75mm	571.43m
Total	2,868.57m



N
W E
S

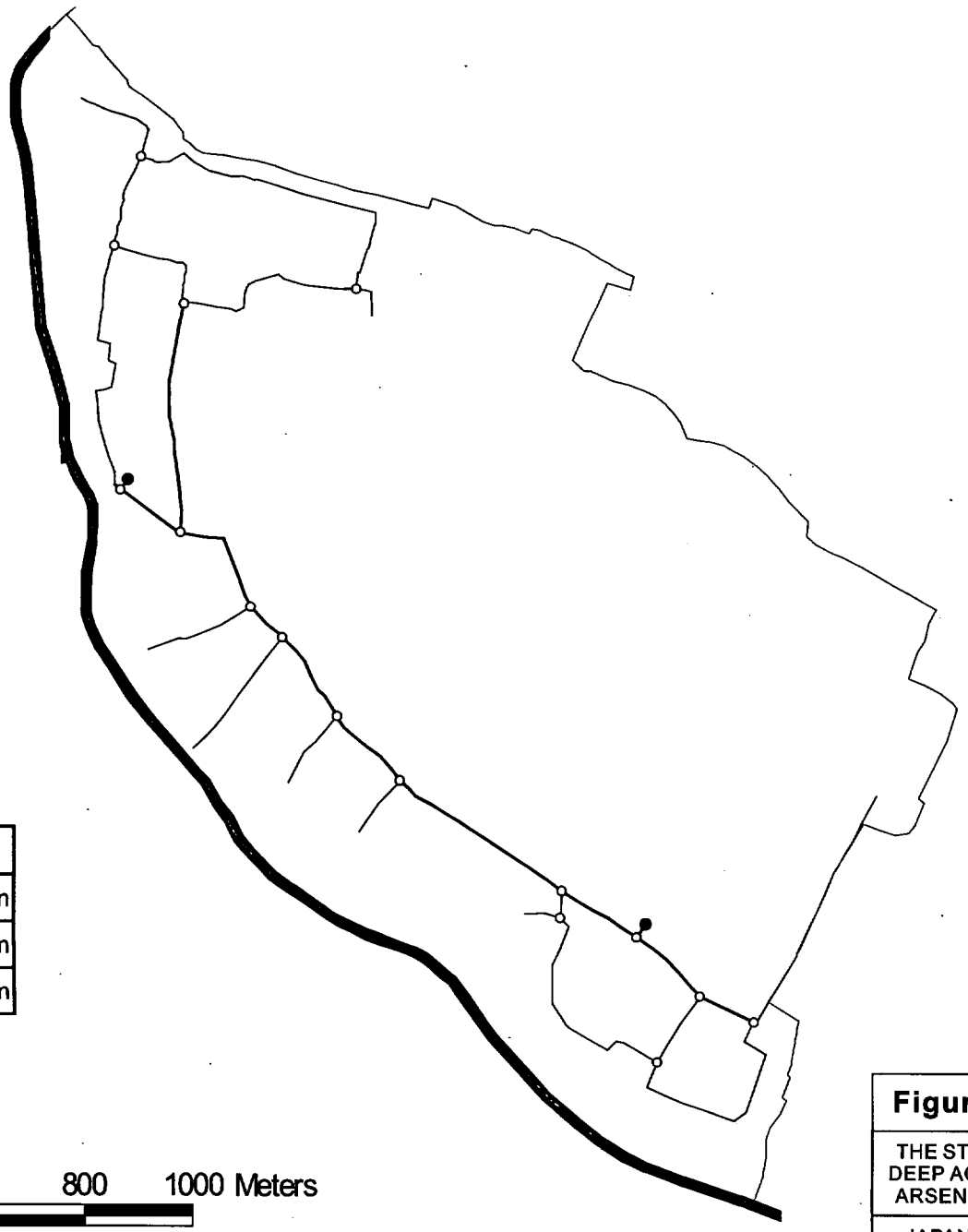
05 Maguradanga

0 200 400 600 800 1000 Meters

Figure 7.11 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Distribution Pipe	
100mm	1,987.50m
75mm	4,287.50m
Total	6,275.00m

0 200 400 600 800 1000 Meters

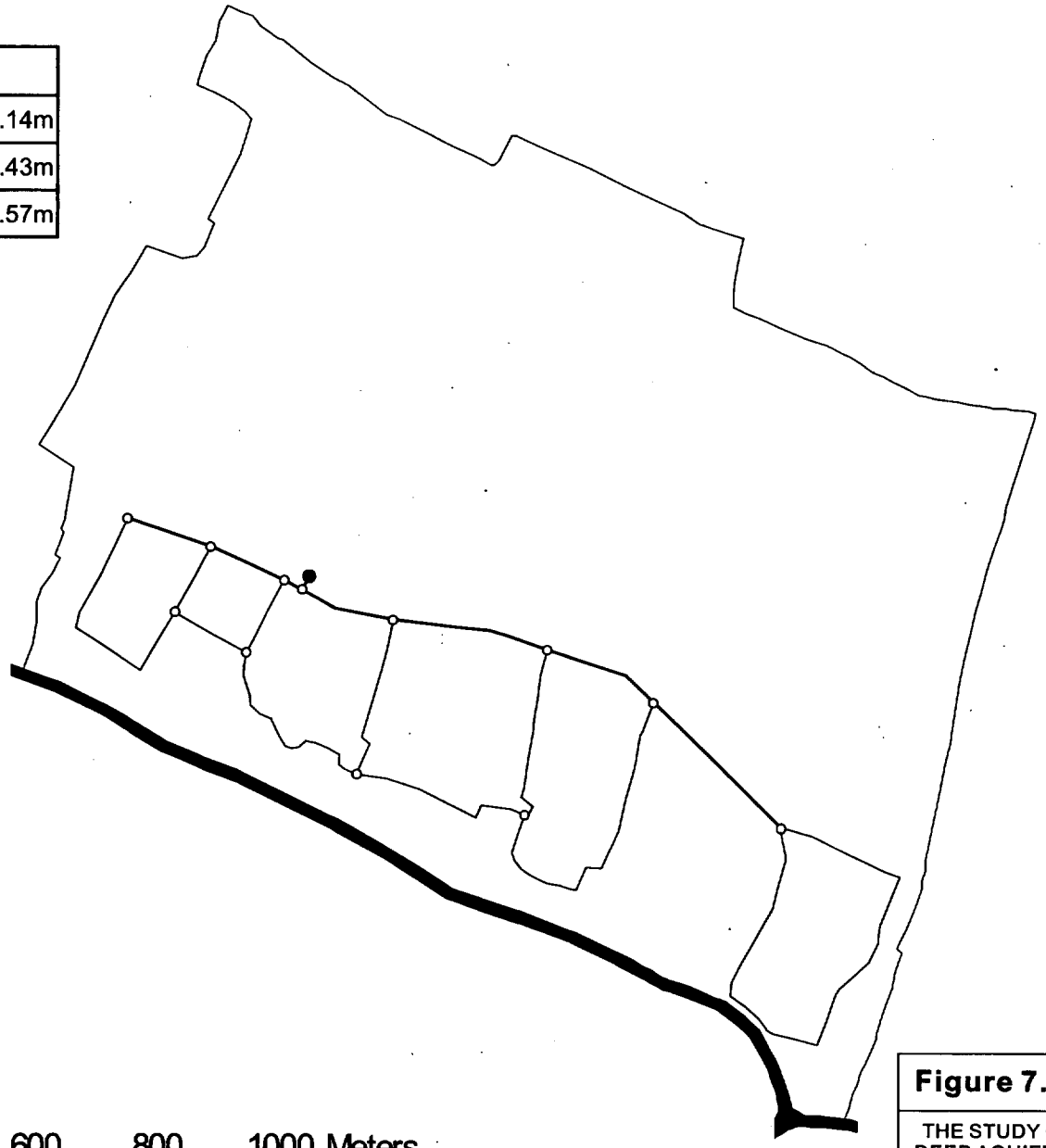
06 Baliadanga

Figure 7.12 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,257.14m
75mm	3,219.43m
Total	4,476.57m



N
W E
S

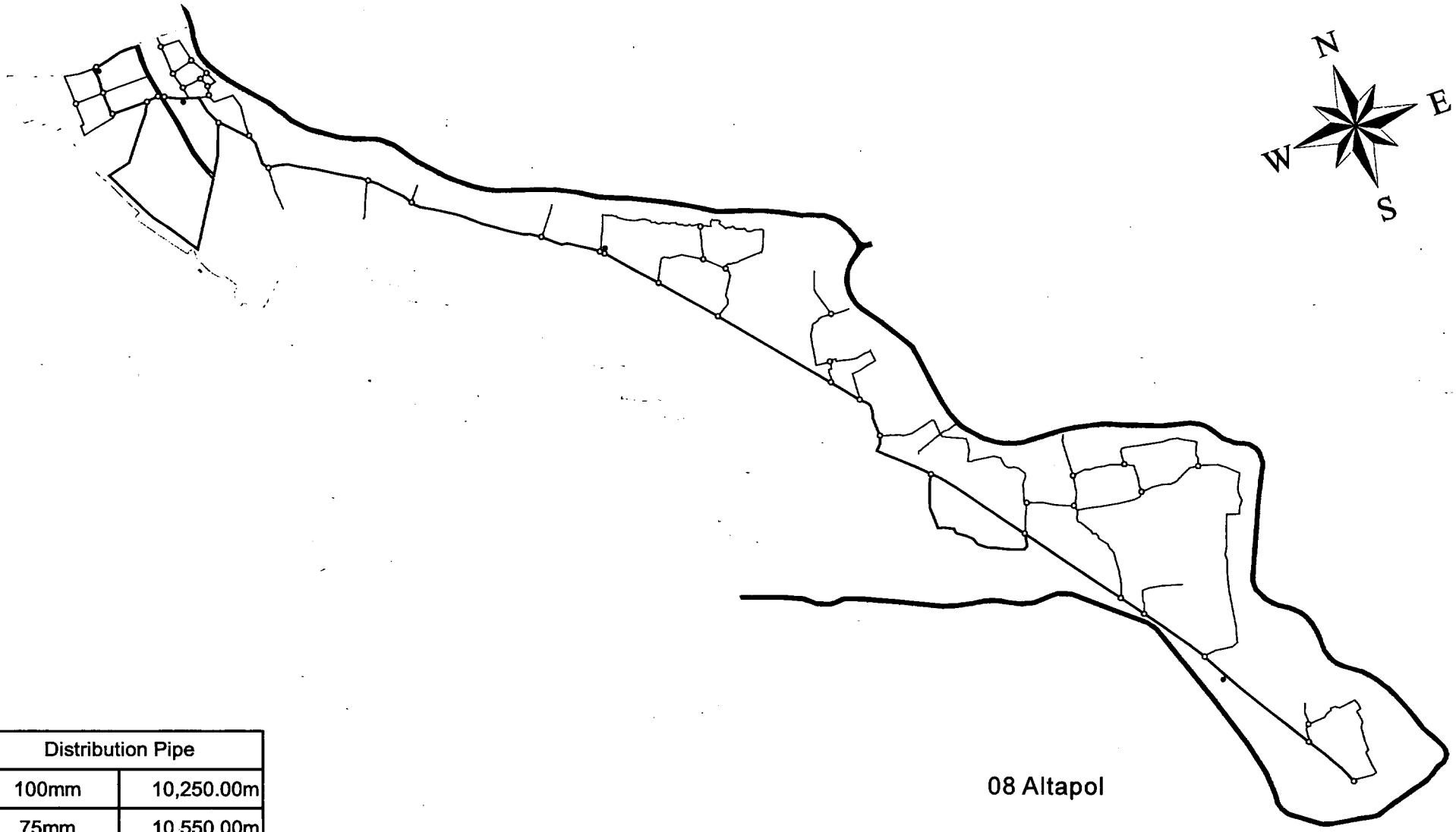
07 Sujapul

0 200 400 600 800 1000 Meters

Figure 7.13 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)



Distribution Pipe	
100mm	10,250.00m
75mm	10,550.00m
Total	20,800.00m

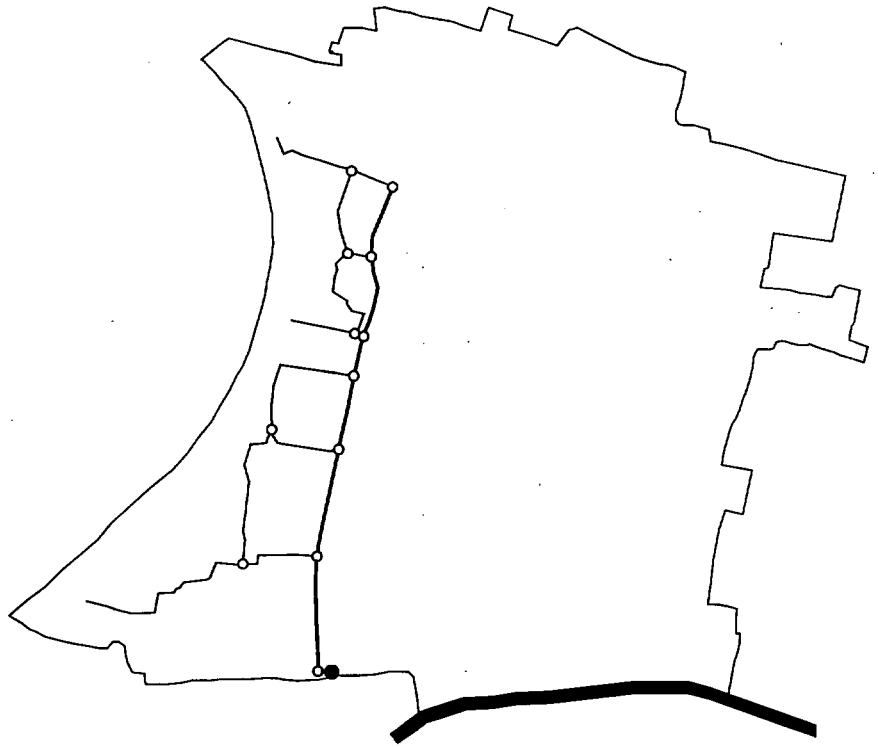
0 200 400 600 800 1000 Meters

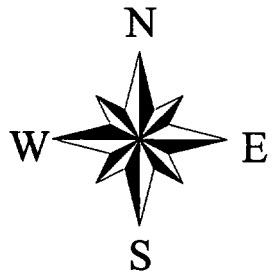
Figure 7.14 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	788.57m
75mm	1,520.00m
Total	2,308.57m





09 Sarfabad

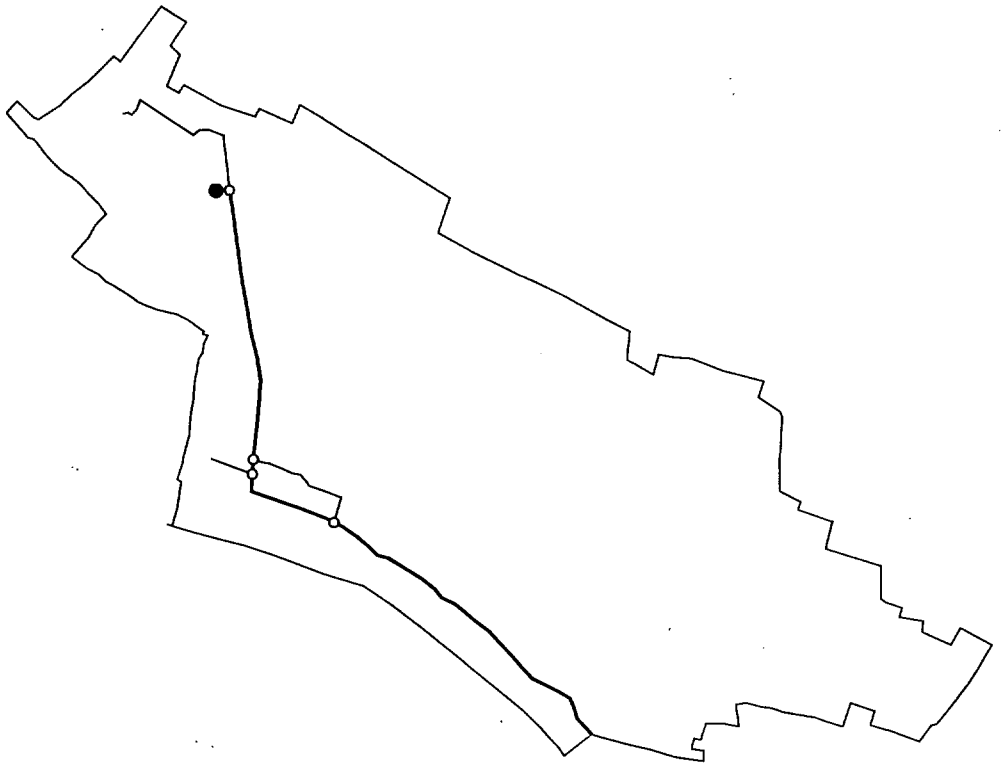
0 200 400 600 800 1000 Meters

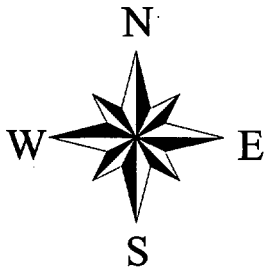
Figure 7.15 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,085.71m
75mm	434.29m
Total	1,520.00m





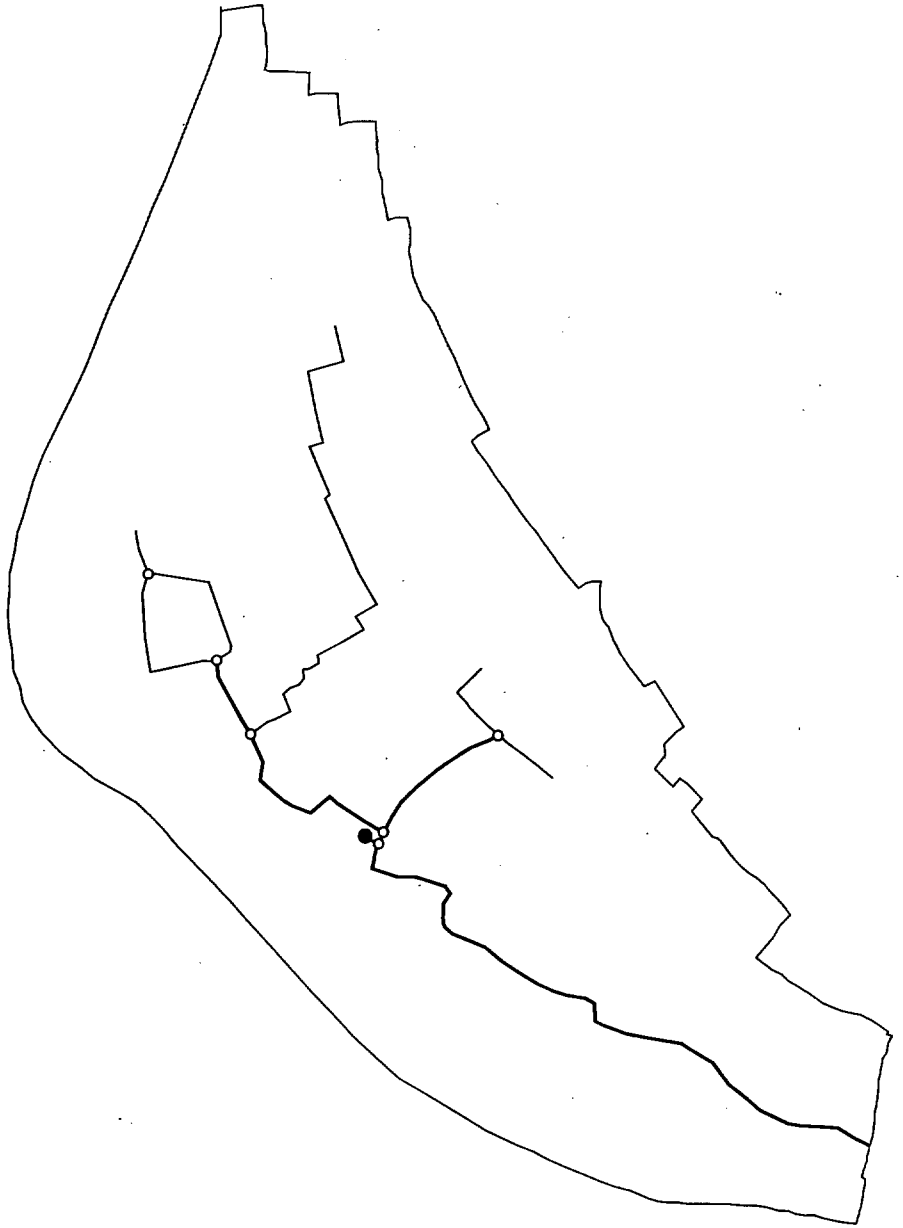
10 Bajitpur

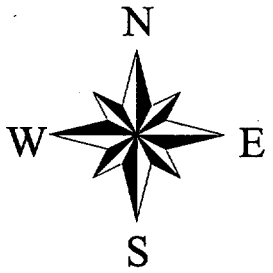
Figure 7.16 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,600.00m
75mm	1,702.86m
Total	3,302.86m





11 Sabdia

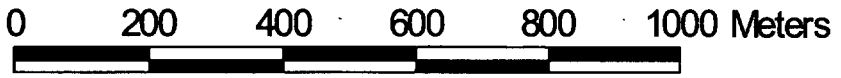


Figure 7.17 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,714.29m
75mm	1,142.86m
Total	2,857.15m

N
W E
S

12 Kesabpur

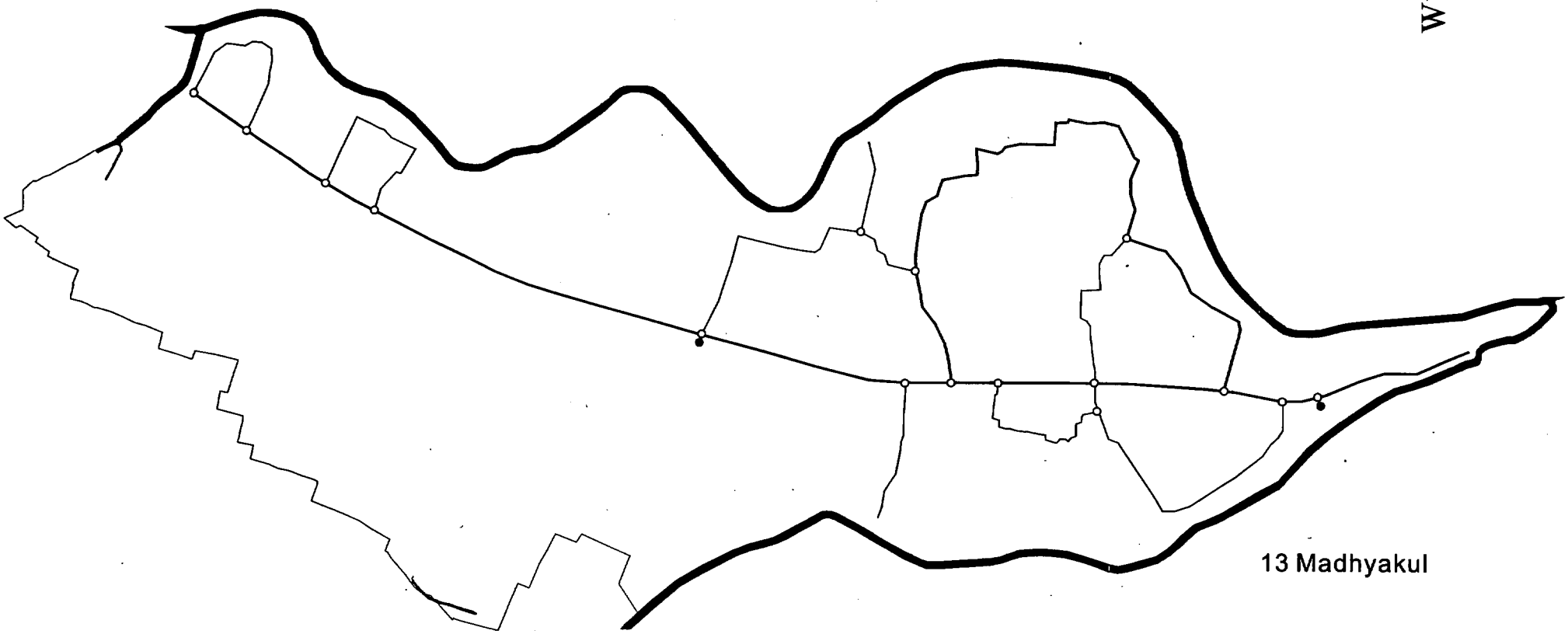
0 200 400 600 800 1000 Meters

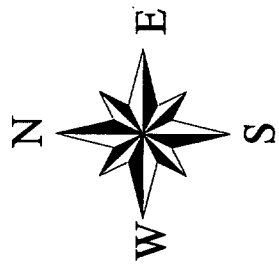
Figure 7.18 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	5,490.20m
75mm	4,235.30m
Total	9,725.50m





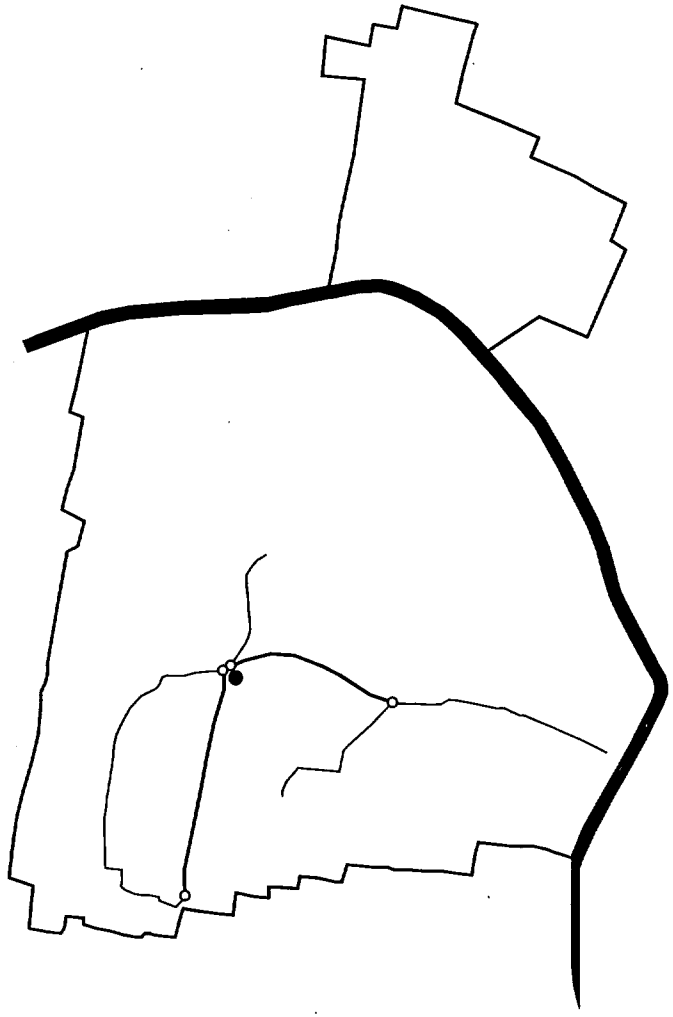
0 200 400 600 800 1000 Meters

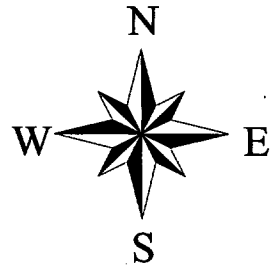
Figure 7.19 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	628.57m
75mm	1,314.29m
Total	1,942.86m





14 Habaspol

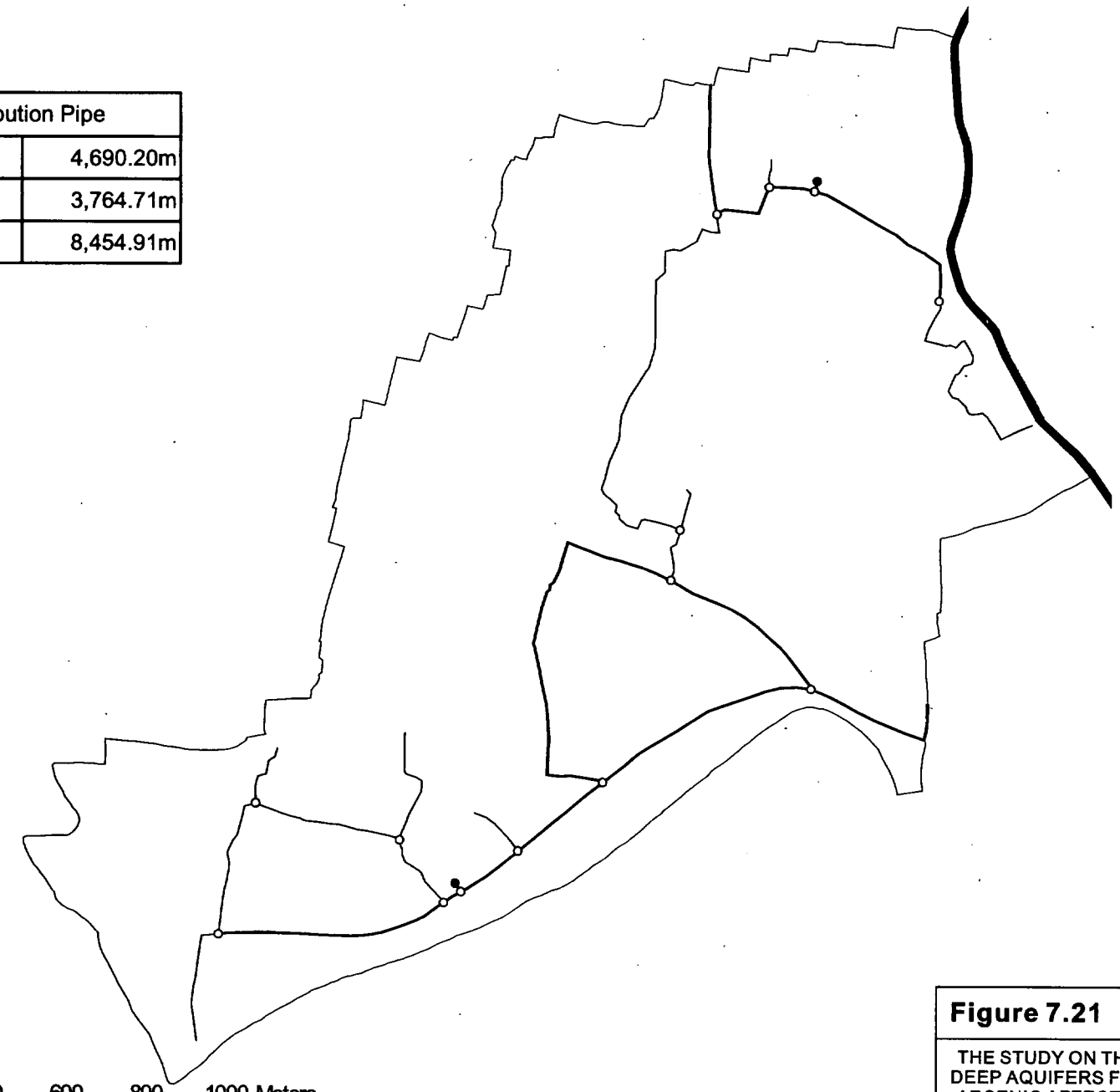
0 200 400 600 800 1000 Meters

Figure 7.20 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	4,690.20m
75mm	3,764.71m
Total	8,454.91m



N
W E
S

0 200 400 600 800 1000 Meters

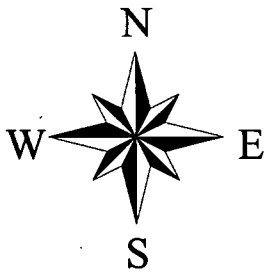
15 Bhagati Narendrapur

Figure 7.21 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

Distribution Pipe	
100mm	1,300.00m
75mm	3,671.43m
Total	4,971.43m



16 Rajnagar Bankabarsi

0 200 400 600 800 1000 Meters

Figure 7.22 Pipe Layout Plan (Level 2)

THE STUDY ON THE GROUNDWATER DEVELOPMENT OF DEEP AQUIFERS FOR SAFE DRINKING WATER SUPPLY TO ARSENIC AFFECTED AREAS IN WESTERN BANGLADESH

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

CHAPTER 8

OPERATION AND MAINTENANCE PLAN

Supporting Report 2

CHAPTER 8 OPERATION AND MAINTENANCE PLAN

8.1 Operation and Maintenance Plan

It is extremely important to develop an arsenic safe alternative water resource in the arsenic affected area. However, this is only a part of the project. Formation of an organization that manages the sustainable maintenance of the alternative water resource is more important than the water resource development.

If the alternative water resource is surface water, water treatment is always necessary to protect people from water-borne infectious diseases. If the alternative water resource is groundwater, safety will not be guaranteed in the future even if it is safe now. Therefore, it is necessary to always monitor the water quality. For that reason, an organization that monitors the water quality of the alternative water resource and manages maintenance of the water supply system supplied by the water resource is necessary. It can be said that the success of the project depends on the functioning of this organization.

In the past, there have been a lot of cases where facilities were not appropriately operated and maintained because the government or a related organization constructed these facilities without listening to the water service user's opinions. Neither the appropriate technology nor the appropriate facility arrangements were adopted, and the user’s intention and ability to pay were not sufficient to cover the value of the service. It is thought that the understanding of the residents was not obtained regarding maintenance, resulting in failure to maintain the water supply facilities.

It is widely known that a lot of residents are the load intentions of some maintenance expense and the load of a part of the cost of construction (money and labor) intentions competent because of one side. Therefore, it is important to promote the technique of community participation to avoid a past example of a crime. For this, the resident’s behavior regarding public health and arsenic poisoning needs to be changed. A resident is expected to participate from the planning stage of the water service plan to the stage of operation and management only after such behavioral change takes place. In many cases, the residents are motivated to change their behavior through public relations campaigns, training, and personal growth concerning hygiene and arsenic poisoning.

8.1.1 Recommendation on the Operation and Maintenance Plan

1) Procedure of Behavioral Change

It is necessary to advance the strategy to achieve a water service that can be sustained by the behavioral change according to the following procedures.

- Public relations and an educational campaign should start before the detailed design of

the water service facilities is performed so the residents can evaluate the water service plan, and decide by themselves. The public relations and enlightenment activities need to focus on the improvement of public health, the prevention of arsenic poisoning, and the water service facilities plan.

- Union Water Service Committees should be initiated. It is necessary to elect the committee from among the water service users. During public relations and the enlightenment stage, the Union Water Service Committee acts as the arbitrator between Mouza residents who are the water service users and DPHE who promotes the project. The committee shares information with the Mouza residents and advises them aiming at the formulation of a good facilities plan by those who promote the project.

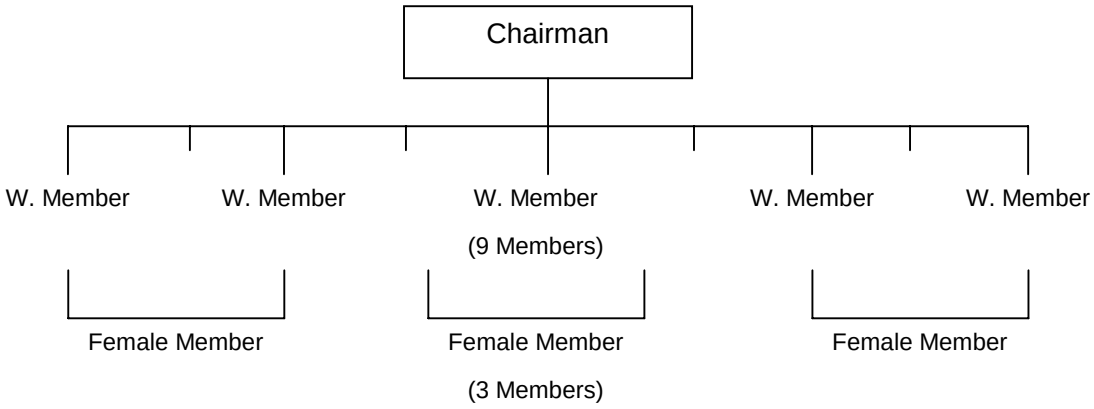
2) Mobilization Plan

A local administrative body in Bangladesh is simple. For instance, the organization of Kesabpur Union, which is the end of an administrative mechanism is as shown in Figure 8.1.1. The union decision making organization is composed of a chairman and 13 members who were elected by public election. There is the secretariat including one secretary and nine staff in charge of the Ward. The chairman is responsible for administration of the Union of 30,000 people or more by this staff.

A lot of NGOs also exist in the rural region. They are active in a lot of fields like education, agriculture, finance, fishery, commerce, and measures for low-income persons, etc. and bear one area of the administration. Some NGOs have already implemented education programs and the public relations campaign program concerning the arsenic intoxication problem. Moreover, there is an NGO that does the installation and maintenance of arsenic removal devices, too. The society here relies on NGOs. The NGOs will play an important role in tying the Mouza residents to the project. It is necessary to execute the following for that.

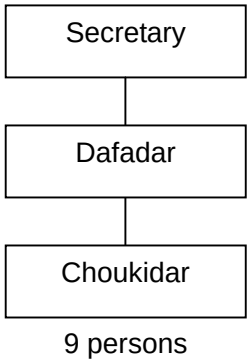
- Inform residents of a more detailed outline of the project.
- Educate them concerning health problems.
- Promote the formation of Mouza Water Service Organization.

UNION PARISAD



Remarks: All of them are elected

OFFICE STAFF



Remarks: Office Staff are appointed by District Commissioner (DC)

Figure 8.1.1 Organization of UNION PARISAD

3) Application of the best technology

The composition of the water service facilities should apply the best technology.

That is;

- Spare parts should be able to be procured in the locale.
- The water service system must be composed of technology known well to the resident.
- The water service system should be one suitable to the environment.

4) Recommended water service facilities maintenance organization

After completing the water service facilities, DPHE and the Union Water Service Committee will inevitably assume the maintenance responsibility.

The role of the Union Water Service Committee

- Management of maintenance work, i.e. management of the O&M cost, approval of the repair cost, etc.
- Deciding on the Mouza residents' role and responsibility concerning O&M, and forming the Mouza Water Service Organization.
- Enactment of ordinances and rules that affect water service activity.
- Promoting the campaign concerning water and hygiene regularly with the cooperation of NGOs.

8.2 Recommended Operation and Maintenance Organization

The recommended operation and maintenance organization is as Figure 8.2.1.

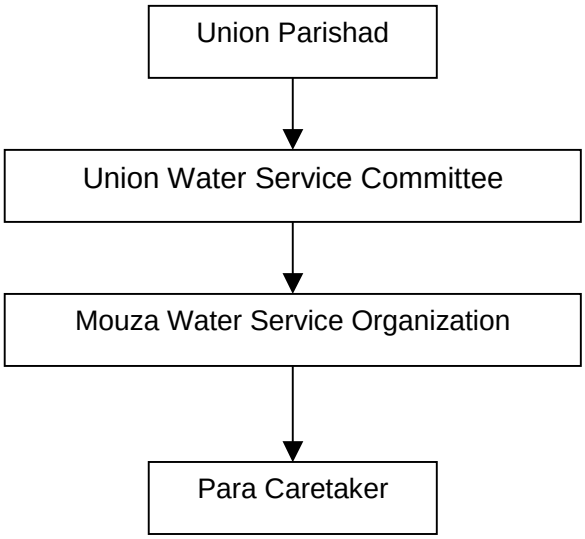


Figure 8.2.1 Recommended Operation and Maintenance Organization

BAMWSP formed UNION ARSENIC COMMITTEE to Kesabpur recently. The organization should be another organization for the maintenance of water service though it is an organization that looks alike. However, it is necessary to achieve a common purpose through cooperation. For that, the chairman of the Union Parisad is assumed the additional post of the chairperson of both committees. The chairman of Union Parisad can then manage all the activities in the Union directly.

The Mouza Water Service Organization reports the operation results and the revenue and expenditure situation every month to the Union Water Service Committee. The Union Water Service Committee works like the management board of directors, so to speak.

8.2.1 Role of each committee

The Union Water Service Committee is responsible for the operating policy and management, and the Mouza Water Service Organization is responsible for daily operation and management. The role of each is as follows.

1) Union Water Service Committee

The Union Water Service Committee assumes all responsibilities for the water service activity and focuses on public relations and enlightenment activities of water and hygiene. The most important function is sustainable water service management. The main activities are as follows.

a. During Project Implementation

- Site securing of facilities assumed to be necessary, i.e. well and overhead tank etc.
- Public relations and enlightenment of manners concerning use of public water service facilities.
- Enactment and revision of rules concerning method of bearing water service charge or repair expense.
- Participation in construction committee (DPHE).
- Election of caretaker in Para and their training.

b. During Operation

- The Union Water Service Committee approves, and supervises the management policy, the water charge, and the budget of the Mouza Water Service Organization. The manager of the Mouza Water Service Organization is responsible for daily operation and management.
- The target of the water production and service is set, and the result is evaluated.
- The activity of the workers of the Mouza Water Service Organization is usually monitored.

- Confirmation of income of water charge decided by rule.
- Check on water service accounting.
- Submitting of regular reports to DPHE, including financial situation, amount of water production, problems with operation and maintenance etc.
- Execution of regular water and hygiene campaigns using NGOs.

2) Mouza Water Service Organization

The Mouza Water Service Organization is organized to do daily operation and maintenance, and put under the management of the Union Water Service Committee. The main business is management of the water resource and management of money like the water charge, the repair expense, etc.

When the majority of the water service is provided through hand pump systems, management is comparatively easy. When submerged motor pumps and overhead tanks are set up, daily operation and maintenance is necessary. As for the operation cost of the submerged motor pump and the maintenance cost of the overhead tank, it is necessary to decide who bears responsibility beforehand.

Operation and maintenance activities are involved in all the mentioned stages and tasks can be divided into **technical tasks** and **non-technical tasks**. The tasks can be categorized into three groups:

- Routine tasks (like daily administration and operation and preventive maintenance;
- Periodic tasks (like administrative reporting, billing and fee collection and larger maintenance tasks including overhauling pumps etc.)
- Occasional tasks (like major repairs or changing of equipment)

The maintenance activities are to maintain the function of all facilities within the range of a permissible standard. It is necessary to do this work in premeditation according to the standard decided by facilities. The manager of the Mouza Water Service Organization is obligated to report on the activity of all the Mouza Water Service Organization to the Union Water Service Committee. This activity is used to reach the planned target. The manager should manage to reach the target.

The manager (Administrator) is the person in charge of the Mouza Water Service Organization, and the role is the following one.

- Overall management of the water works, including staff.
- Administration of the entire system as per guidelines, by-law etc.
- Maintenance of all facilities such as overhead tank, wells, and well pumps.
- Elaborate the daily, weekly and monthly work schedule.
- Appropriate management such as keeping spare parts.
- Report monthly to Union Water Service Committee.

Water Supply Facilities Operator

O&M of Overhead Tank

A deliberate inspection and cleaning are necessary once every two years.

O&M of Well Pumps

The operation and management of the well pump is described in the maintenance manual for the well pump. It is important that the operator is well versed in these manuals to carry out operation and management appropriately. The pump contractor should prepare the necessary maintenance manual, and it is necessary to draw the training of the operator partially of contract.

The main tasks of the pump operators include all functions related to the operation and maintenance of the Deep Well and the installed pump and will include:

- Daily inspection of raw water pump operation and lubrication of movable parts;
- Daily monitoring and recording volume of water extracted, power consumption and pumping pressure;
- Daily control of facilities and protection of source from contamination/infiltration of pollutants;
- According to the conditions of the well, cleaning of submerged pump/filter (manually and by back-washing or gravity) annually.

Motor and pump should be maintained according to supplier's specification. To prevent pump damage, preventive maintenance should be carried out involving greasing the motor. The supplier of equipment must provide detailed specifications on maintenance. This shall be recorded in the Maintenance Handbook.

8.3 Capacity Building Plan

The purpose of the capacity building is as follows.

(1) Offer a water service system that provides a sustainable water supply with arsenic safe groundwater in the target area.
(2) Execute hygiene education to target Mouzas.
(3) Offer organizational capacity building training. The sustainable maintenance of water service facilities should be possible through continuous hygiene education.

As a result, when the project is completed, the sanitary management of the water service facilities by the Mouza residents themselves and the improvement of public health will be realized.

8.3.1 Capacity Building Organization

It is necessary to include a national training team in the post in charge of the project at the national level. It is also necessary to prepare a concrete program for the capacity building (trainers trainee program, etc.). The substantial project promotion organization should be set up in the District. It is necessary to form the team in charge of capacity building in that. The team is composed of the staff of DPHE who manages the construction of facilities and trains in O&M, and NGO members who are in charge of the enlightenment of residents. Those who train in the District receive training in special topics which include not only general educational technology and training but also the following.

- Community participation.
- Environment and hygiene education.
- Management and supervision of construction.
- Operation and maintenance of rural water-supply facilities (technology and finance).

8.3.2 Training-Needs of Union and Mouza Organization

As for the capacity building of the Union and Mouza, it is necessary to gradually follow the procedure below.

- Before a detailed plan, the design and the construction of rural water service facilities start, it is necessary to perform effective dissemination and communication activities with the leaders of the target area (Union Parisad Chairman, etc.).
- Union Water Service Committee should be established. The Union Parisad Chairperson is made Chairman of the Committee. It is necessary to elect the members from among the users of the water service facilities. Also, the enlightenment activity of the Mouza residents is done in cooperation with NGOs.

Sustainable Water Service management greatly depends on the residents' willingness and ability to pay the maintenance cost. This willingness to pay hangs on an understanding of and agreement to the convenience that the resident receives by the water supply. It is not possible to achieve the improvement of public health with a water service system that only some of the people can use. Therefore, it is necessary to select a water service system that minimizes the maintenance expense so that the low income persons may also use it.

It is understood that the development of arsenic safe groundwater is possible in the target area. As for the water service system, two ideas are considered. One is a hand pump method, and the other is to supply water by pipe and the use of an overhead tank. As for the latter, the benefit and convenience is high but the maintenance expense rises, too. The final decision of the water service system needs to be made by the residents after the relationship between water and hygiene and the relationship between the cost and convenience is well understood. Such

information is expected to be clarified as part of the enlightenment activity, though a social economic investigation has already been executed.

1) Training Needs of Union Water Service Committee

The role of the Union Water Service Committee is to offer the residents arsenic safe water. The campaign for water and hygiene is promoted at the same time. Moreover, the committee is a superintendent in the water service facilities, and is expected to become an adviser to DPHE. The committee should be formed before the water service facilities are constructed. The committee plays a central role in the enlightenment activities for the residents while constructing facilities. After facilities are completed, the committee becomes a maintenance management body.

Training for the Union Water Service Committee is as follows.

- Items that concern resident enlightenment.
- Health risk of water-borne diseases.
- Water service charge calculation method.
- Community participation technique.
- Woman's role concerning water and hygiene.
- Dispute solution method.
- Water service maintenance management rule and ordinance enactment method.
- Basic water service management planning method.
- Maintenance method of water resources.
- Items that concerns maintenance management.
- Maintenance method of water service facilities.
- Operation and maintenance cost.
- Water service charge calculation method.
- Accounting method and annual report making.
- Charge collection method and payment record method.
- Consumer relations.

2) Training Needs of Mouza Water Service Organization

The majority of the water service facilities are hand pump systems; however, submerged motor pumps and overhead tanks are introduced into some. The construction of the water service facilities that include the submerged motor pump and the overhead tank is the first in this region. Therefore, the operator is recommended to participate in the construction stage, and to adequately understand how these facilities function.

Training needs of Manager (Administrator) of Mouza Water Service Organization.

The manager (Administrator) is the person in charge of daily operation and maintenance of the water service facilities. Therefore, the following training is necessary.

- Acquisition of technology of water service facilities and general theories of operation.
- Health risk by use of polluted water.
- Accounting method.
- Personnel management.
- Consumer relations.
- Operation and maintenance of facilities.
- Workforce plan and work schedule.
- Report making method.
- Water charge calculation.
- Budget management.

Training needs to pump operator

- Acquisition of knowledge of operation management of pump equipment.
- Decomposition maintenance method when pump and electric equipment are maintained.
- Repair method of minor electrical breakdowns.
- Report making to manager.