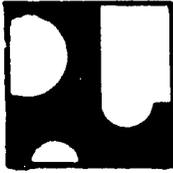


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REPUBLIC OF INDONESIA
MINISTRY OF PUBLIC WORK
DIRECTORATE GENERAL OF HOUSING BUILDING
PLANNING AND URBAN DEVELOPMENT (CIPTA KARYA)

MEDAN URBAN DEVELOPMENT HOUSING WATER SUPPLY AND SANITATION PROJECT

MONTHLY REPORT 17
1 JULY 1980 THROUGH 31 JULY 1980

ENGINEERING - SCIENCE, INC. SINOTECH ENGINEERING CONSULTANTS INC

A JOINT VENTURE
in association with
PADCO and P.T. DACREA

MEDAN URBAN DEVELOPMENT, HOUSING, WATER SUPPLY AND SANITATION PROJECT

Jln. Singamangaraja 1-3, P.O. Box 28, Phone 28718, Medan-Sumatra, Indonesia

Our ref.: 80/1040/GWDP

Medan, 4th August 1980

DIRECTOR GENERAL CIPTA KARYA
Ministry of Public Works
Jalan Pattimura 20
Kebayoran Baru
JAKARTA SELATAN

SUBJECT : Monthly Progress Report 17
1 July 1980 through 31 July 1980

REFERENCE : Contract dated 17 October 1978, between
Ministry of Public Works, Directorate
General of Housing, Building, Planning
and Engineering-Science, Inc.

Gentlemen:

In compliance with Article 10.15 of our Agreement, Engineering-Science, Inc. submits Monthly Progress Report 17 for the Calendar period 1 July 1980 through 31 July 1980.

SECTION I - PRIMARY ACTIVITY PROGRESS

The electric log for the observation well at Medan Denai was finalized on July 7, 1980. Drilling of the test well began on July 19, 1980 and pilot bore was finished on July 25, 1980.

Completion of the electric log and comparison with those of the KIP-Kotamatsum wells and the Medan Denai lithologic log indicated little productivity below 185 and above 200 m depth. Therefore, the designs for the test well at Medan Denai used a pilot hole to 190 m depth which may be logged electrically. Following final interpretations of logs from the observation well and test well, reaming of the pilot hole to the final well diameter of 300 mm will extend down to about 190 or 195 m depth. No electric log was made of the pilot hole. As of July 31, reaming had just begun.

Electric logs have indicated a major groundwater aquifer at 20 to 40 m depth with thinner aquifers scattered between 105 to 180 m depth. The Kotamatsum wells on Ismailiyah Street and Laksana Street produced up to 20 l/s with a drawdown of about 10.0 m and an operating depth of 21 m. Similar production and yields can be expected at Medan Denai, although the static water level in the Medan Denai observation well has been measured at 5-6 m depth (differences with Kotamatsum wells reflect differences of ground level elevations).

Drilling of the test well at the Mabar Industrial Estate began on July 4 and the pilot bore was drilled to 185 m on July 12, 1980. After electric logs were made on July 13, reaming began on July 14 and was completed to 185 m on July 27, 1980. Well casings, screens and gravel packs will be installed and the remainder sealed with cement. The well design includes:

<u>UNITS</u>	<u>DIMENSIONS</u>		<u>TOTAL</u>
13	200 mm (8-inch)	Steel Pipe 6.0 m long	78 m
12	150 mm (6-inch)	Steel Pipe 6.0 m long	72 m
10	150 mm (6-inch)	Continuous Slot Screens	30 m

Screens will be placed at the following depths:

	<u>DEPTH</u> <u>(m)</u>	<u>LENGTH OF SECTION</u> <u>(m)</u>	<u>TOTAL LENGTH</u> <u>(m)</u>
1	125-140	18	18
2	158-173	12	30

SECTION II - PERFORMANCE

Dr. C.T. Williams, ES Hydrogeologist joined Ralph Smith for the final phases of well drilling, testing and analyses of test results. The two senior hydrogeologists and the local hydrogeologist supervised continued drilling of the Madan Denai and Mabar wells. Water samples, temperatures and levels were taken in observation wells and in the shallow water well at Mabar. Lithological samples from the test well were collected and analyzed. These were compared to lithological logs from the observation wells and the electric logs from both observation and test wells at each site.

The hydrogeologists supervised and monitored the installation of casings, and screens, and the placement of the gravel pack and cement seals. Final designs for the casing, screens, and gravel pack were prepared by the senior hydrogeologist. Both wells used 30 m of ϕ 50 mm diameter screens and have total depths of about 180 m.

Monitoring of water levels in the observation wells was required to document trends in the ground water aquifers which may influence the results of the testing.

SECTION III - PRELIMINARY FINDINGS

Lithological, electric logs and water temperatures and levels are presented in Attachment.

Preliminary analyses indicate one major shallow aquifer occurs between 20 and 50 m depth. This aquifer has iron content of more than 5 mg/l in some samples, has a high water level of 1.0 - 2.0 m depth and a lower water temperature of 27°C - 28°C compared to aquifers below 50 m depth. These differences indicate that the upper aquifer is isolated from the deeper aquifers and any leakage between the shallow and deep aquifers will be readily discernible. Because of the poorer water quality, additional cement will be used in the wells to seal to 100 m depths.

SECTION III - PLANNED PROGRAMS AND ACTIVITIES

Because of unstable formations at Medan Denai, completion of the observation well was seriously delayed. Furthermore, drilling schedules had to be revised but could not be extended to around-the-clock drilling because of religious activities at the adjacent mosque during the Islamic month of fasting - Ramadhan. These factors delayed the drilling of the Medan Denai test well. Problems with equipment and water supply further delayed reaming of the test pilot hole. The anticipated date for completion of the Medan Denai well is August 10 with testing completed by August 20.

The Mabar well drilling experienced delays due to equipment failures during the last phases of reaming. During installation of the well assembly, numerous collapses and recirculating further delayed completion of the test well. The test well should be completed by August 10 and tested by August 20.

ENGINEERING SCIENCE INC. Sincerely,
MEDAN DENAI PROJECT
INDONESIA
C.T. WILLIAMS
Senior Hydrogeologist



Distribution:

Ir. Ruslan Diwiryo, Director of City & Regional Planning
Ir. Susanto Mertodigrat, Director of Sanitary Engineering
Ir. Sunaryo, Head Sub-Directorate Town Planning
Ir. K. Pohan, Project Manager, MUDS
AID - Jakarta, attn.: Mr. P.Thorn, Project Officer
ES - Arcadia
DACREA - Jakarta

TW/s

**IMPLEMENTATION AND STAFFING SCHEDULE
FOR TEST WELL DRILLING PROGRAM**

	1 March 1980		Project Month				
	1	2	3	4	5	6	7
TASK SCHEDULE							
1. Observe drilling of Tirtanadi wells					
2. Prepare tender documents for 2 additional test wells and 2 observation wells						
3. Evaluate contract proposals and award contract					
4. Drilling and testing				
5. Data evaluation				
6. Preparation of draft report						
7. Review by GOI							
8. Final report printing							
STAFF SCHEDULE							
ES Senior Hydrogeologist			
Local Hydrogeologist				

Staff Schedule Legend
on-site

activity for April 1980
through July 1980

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**DAILY DRILLING REPORT
MEDAN DENAI TEST WELL**

DATE	DAILY DRILLING (m)	TOTAL DRILLED (m)	DRILLING TIME (hrs)	ADDITIONAL WORK
July 1	0	0		16:W
2	0	0		16:EL
3	0	0		16:EL
4	0	0		16:W
5	0	0		16:W
6	0	0		16:W
7	0	0		16:W (Mud)
8	0	0		6:R 2:C 6:W 2:O
9	0	0		6:R 4:C 6:O 2:P
10	0	0		6:E 4:O 2:P
11	0	0		6:C 6:O 2:P
12	0	0		6:F 6:O
13	0	0		12:O 4:P
14	0	0		10:GP 6:E
15	0	0		4:GP 2:C 10:E
16	0	0		8:GP 8:S 2:E
17	0	0		16:W 6:D
18	0	0		16:O
19	53	53	12/8	3:O 1:E
20	21	74	10/6	4:E 2:W (Water)
21	65	139	12/12	2:E 2:W (Water)
22	0	139		6:E 10:W (Water)
23	0	139		12:C 4:W (Water)
24	0	139		14:C 4:O
25	0	139		8:C 12:O
26	0	139		8:C 4:E 4:O
27	0	139		16:W (Mud)
28	27	166	14/13	2:O
29				16:W (Water)
30	24	190	16/15	4:E,O
31	Pilot completed			4:C 4:O 6:E

Note:

W = Waiting	C = Cleaning Hole
EL = Electric Logging	P = Prayer Delay
R = Reaming	S = Cement Seal
E = Equipment Repair	O = Other Activities
D = Development	

**LITHOLOGIC LOG OF THE
MEDAN DENAI TEST WELL**

DEPTH INTERVAL (m)	DESCRIPTION OF WELL CUTTING	AQUIFER THICKNESS	
		(m)	Total (m)
0 - 1.5	Soil/Debris		
1.5 - 6	Sand	4	4
6 - 9	Gray clay		
9 - 12	Gravel	3	7
12 - 22	Gray sandy clay		
22 - 34	Coarse sand	12	19
34 - 42	Sand	8	27
42 - 47	Sandy clay		
47 - 53	Coarse sand and clay		
53 - 61	Sandy gray clay		
61 - 67	Sand	5	33
67 - 78	Sticky clay		
78 - 80	Coarse sand	2	35
80 - 91	Gray clay		
91 - 95	Gravel	4	4
95 - 108	Sticky clay		
108 - 112	Coarse sand	4	8
112 - 116	Sandy clay		
116 - 119	Coarse sand	3	11
119 - 126	Sticky clay		
126 - 131	Sand	5	16
131 - 134	Clay		
134 - 136	Sand	2	18
136 - 139	Clay		
139 - 142	Gravel	3	21
142 - 150	Sticky clay		
150 - 153	Gravel	3	24
153 - 157	Sandy clay		
157 - 162	Sticky clay		
162 - 166	Gravel	4	28
166 - 170	Sandy clay		
170 - 182	Gravel	12	40
182 - 190	Sticky clay		

LITHOLOGIC LOG OF THE
MABAR INDUSTRIAL ESTATE TEST WELL

DEPTH INTERVAL (m)	DESCRIPTION OF WELL CUTTINGS
0 - 2	Sand, very fine-grained yellowish gray
2 - 4	Sand, very fine-grained, medium gray
4 - 8	Sand, very-grained, medium gray with numerous wood fragments
8 - 13	Wood fragments with some fine sand
13 - 16	Sand, fine-grained
16 - 19	Sand, fine-grained
16 - 19	Pumice, broken
19 - 27	Pumice, broken with some wood fragments
27 - 30	Sample missing
30 - 34	Pumice, broken with some wood fragments
34 - 38	Wood fragments with pumice fragments
38 - 40	Sand, very fine-grained, medium gray
40 - 42	Sand, fine-grained, medium gray
42 - 44	Sand, fine-to-coarse-grained, and shale
44 - 46	Sand, fine-grained
46 - 48	Sand, fine-to-coarse-grained, fossiliferous
48 - 50	Sand, coarse-grained and shale
50 - 52	Sand, fine-grained
52 - 56	Pumice and wood fragments; fossiliferous
56 - 66	Pumice; fossiliferous with some shale
66 - 72	Clay, light gray
72 - 74	Sample missing
74 - 76	? Pumice, gray with some "glass" particles and shale
76 - 84	Clay, light gray
84 - 86	Pumice
86 - 100	Clay, light gray with some pumice
100 - 104	Sand, coarse-grained
104 - 108	Clay, light gray
108 - 110	Clay, light gray with medium-to-coarse-grained sand
110 - 116	Sand, medium-to-very coarse-grained
116 - 118	Sand, medium-to-very coarse-grained and light gray shale
118 - 120	Clay, light gray and gravel
120 - 126	Gravel with light gray shale

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DEPTH INTERVAL (m)	DESCRIPTION OF WELL CUTTINGS
126 - 128	Clay, light gray with some gravel
128 - 136	Clay, light gray with some coarse-grained sand
136 - 138	Gravel, fine with some light gray shale
138 - 140	Clay, light gray with some coarse-grained sand
140 - 142	Gravel with some light gray shale
142 - 144	Clay, light gray and coarse-grained sand
144 - 146	Sand, fine-to-coarse-grained
146 - 148	Clay, light gray
148 - 152	Clay, light gray and fine-to-coarse-grained sand
152 - 154	Clay, light gray and fine gravel
154 - 158	Gravel, fine and coarse-grained sand with some light gray shale
158 - 162	Sand, coarse-grained
162 - 164	Gravel, fine and coarse-grained sand
164 - 166	Clay, light gray and some medium-grained sand
166 - 168	Sand, medium-to-coarse-grained
168 - 178	Clay, light gray and very coarse-to-medium-grained sand
178 - 184	Sand, very coarse-to-medium-grained sand
184 - 185	Clay, light gray with coarse-to-medium-grained sand

**DAILY DRILLING REPORT
MABAR INDUSTRIAL ESTATE TEST WELL**

DATE	DAILY DRILLING (m)	TOTAL DRILLED (m)	DRILLING TIME (hr)	ADDITIONAL WORK
July 1	0	0	0	-:0
2	0	0	0	-:0
3	0	0	0	-:0
4	6	6	3	8:0
5	14	20	7	2:E
6	0	20	0	-:0
7	0	20	0	-:E -:0
8	52	72	12	2:0
9	10	82	0	-:W
10	36	118	8	8:E 2:0
11	24	142	11	4:E 2:0
12	43	185	14	3.5:E 2.5:0
13	Pilot completed			EL
14	3	3	1	1:R 1:0
15	37	40	9	1:W 4:E
16	42	82	12	2:W
17	12	94	11	2:W
18	17	113	11	2:E 1:W
19	15	128	10	
20	15	143	10	
21	15	158	10	
22	10	168	10	
23	0	0	0	16:E
24	0	0	0	16:E
25	0	0	0	16:E
26	0	0	0	16:W (Mud)
27	10	178	10	
28	7	185	4	10:C
29	Reaming completed		0	6:I 10:C
30	0	0	0	16:W
31	0	0	0	16:W

Note:

W - Waiting	C - Cleaning Hole
EL - Electric Logging	I - Installation of Well Assembly
R - Reaming	O - Other Activities
E - Equipment Repair	