

Fig.14-8 Section of Geological Investigations for Rock Material Site (No.3 Dam Site)

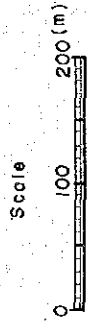
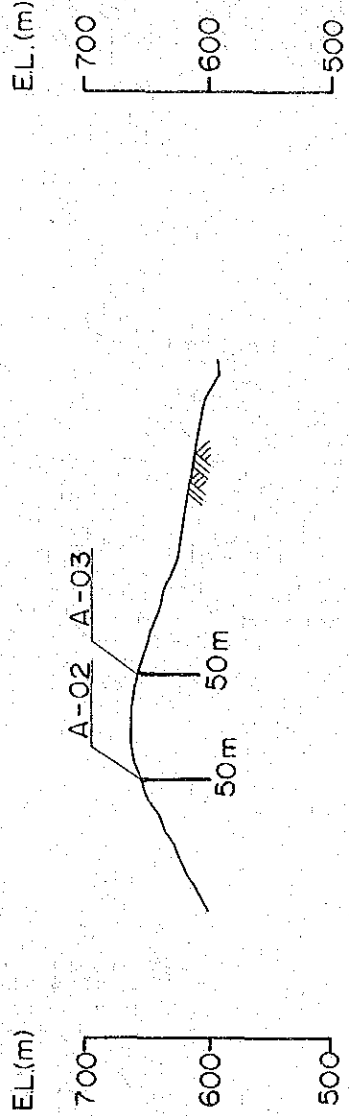
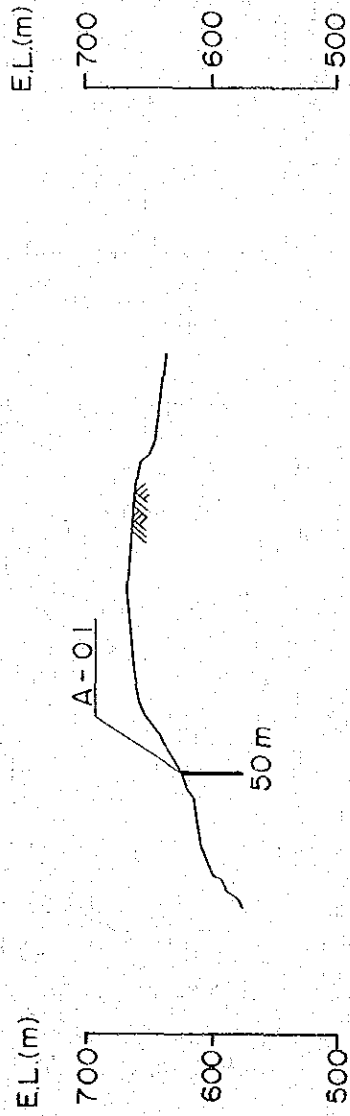
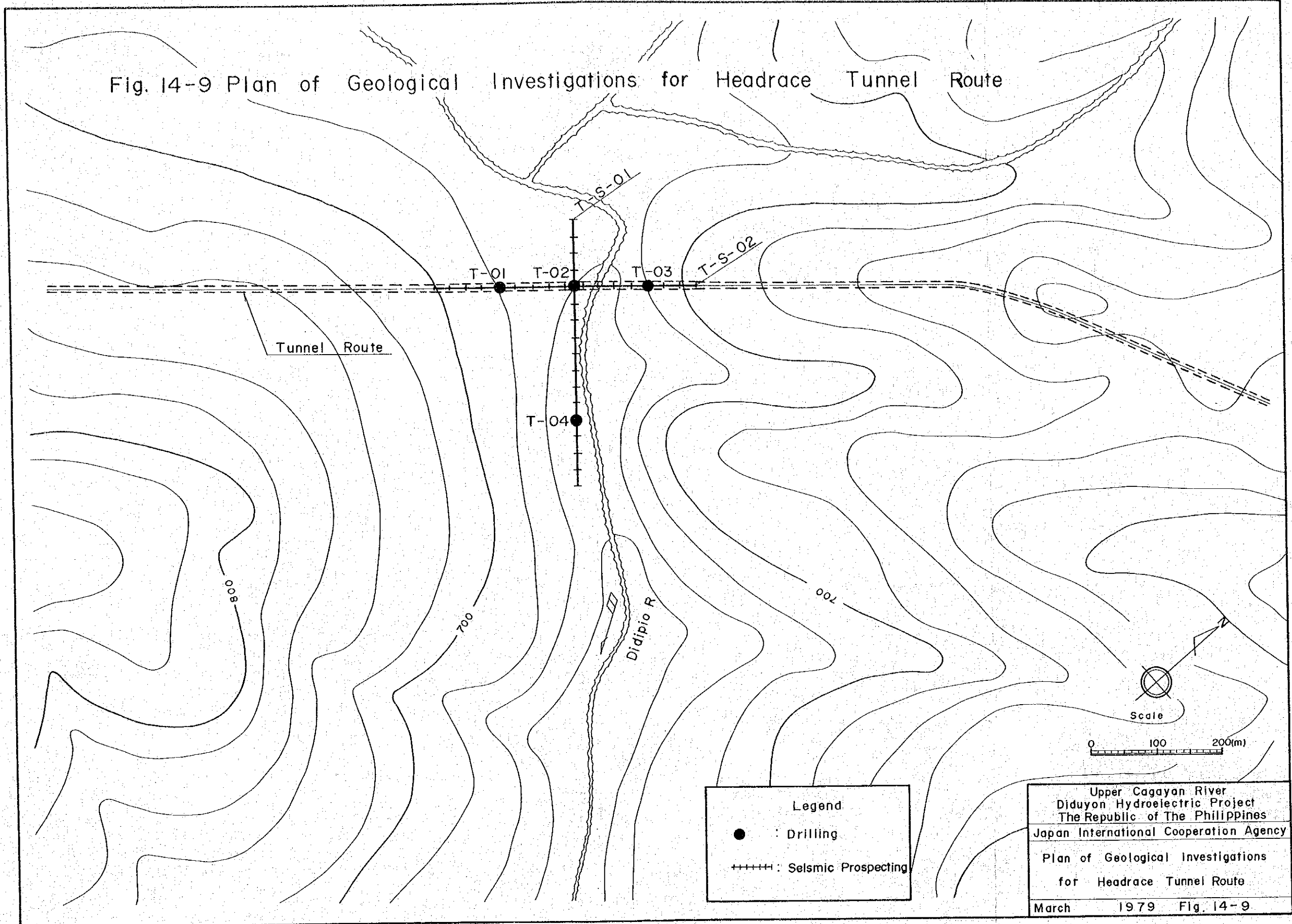


Fig. 14-9 Plan of Geological Investigations for Headrace Tunnel Route



Legend

- : Drilling
- ++++ : Seismic Prospecting

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Plan of Geological Investigations
 for Headrace Tunnel Route

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Fig. 14-10 Section of Geological Investigations for Headrace Tunnel Route

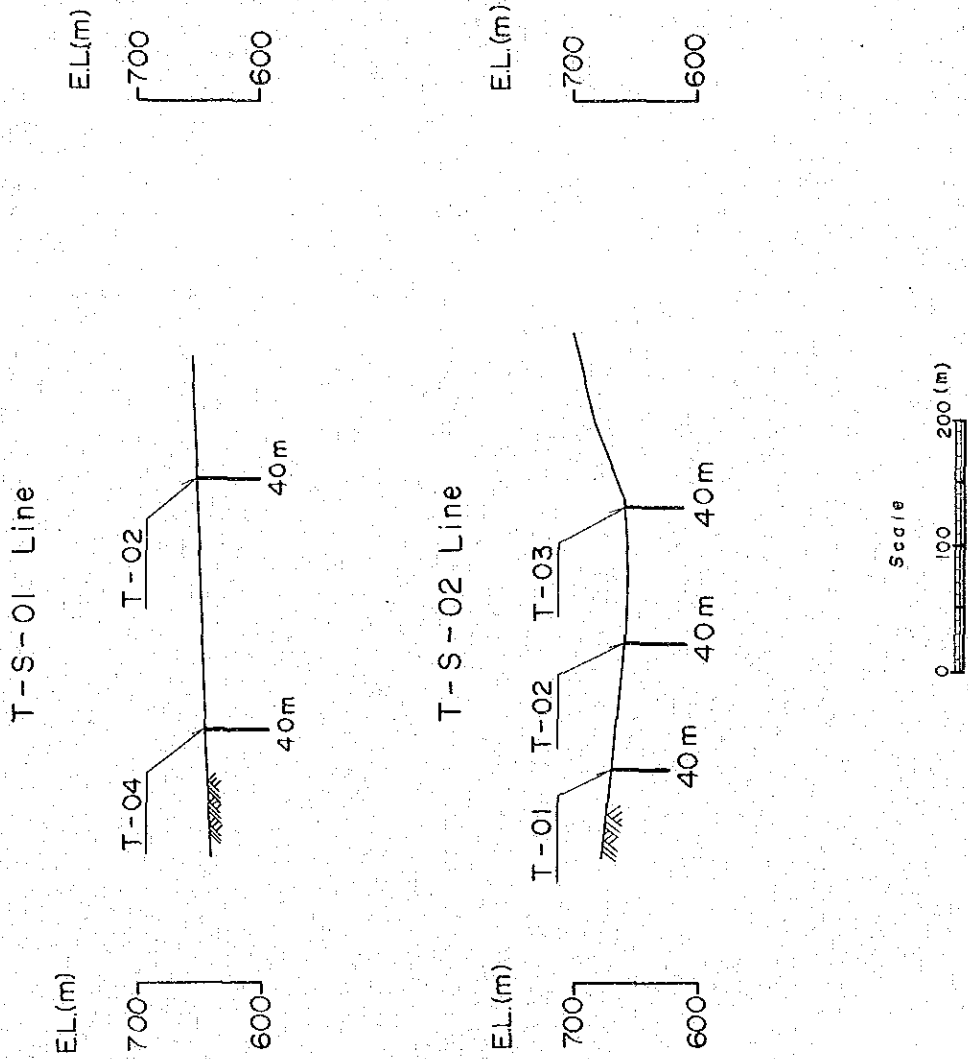
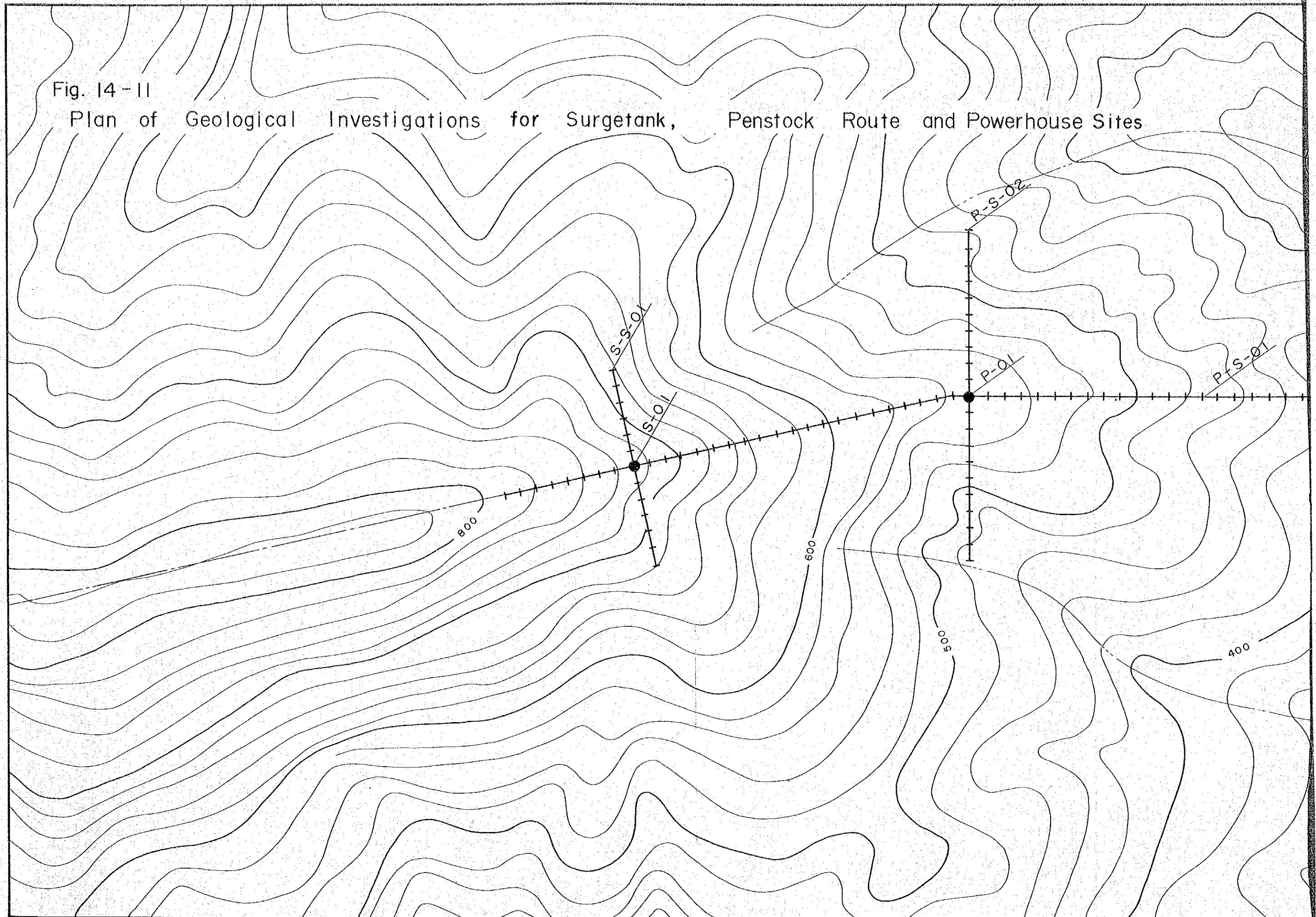
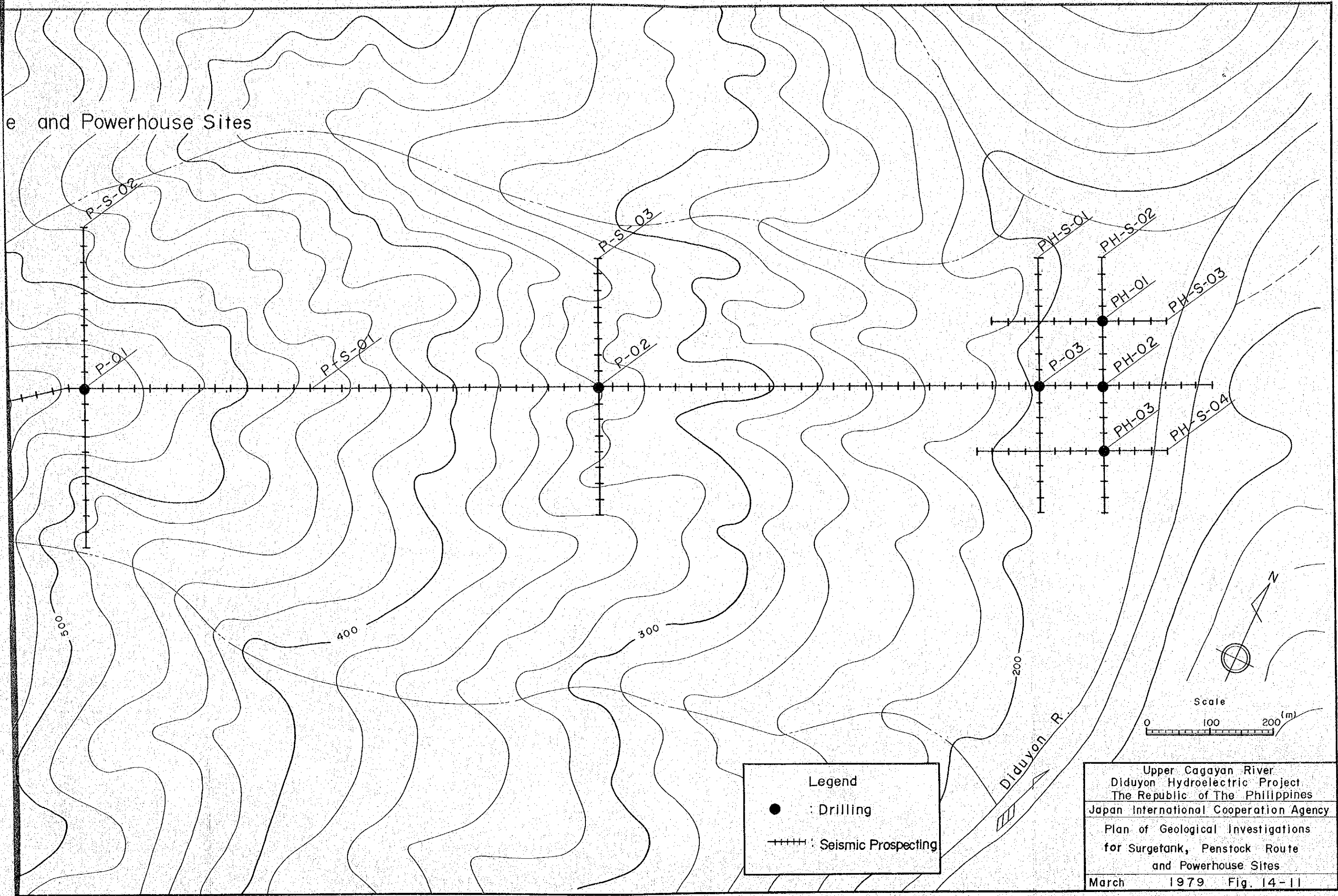


Fig. 14-11

Plan of Geological Investigations for Surgetank, Penstock Route and Powerhouse Sites



e and Powerhouse Sites

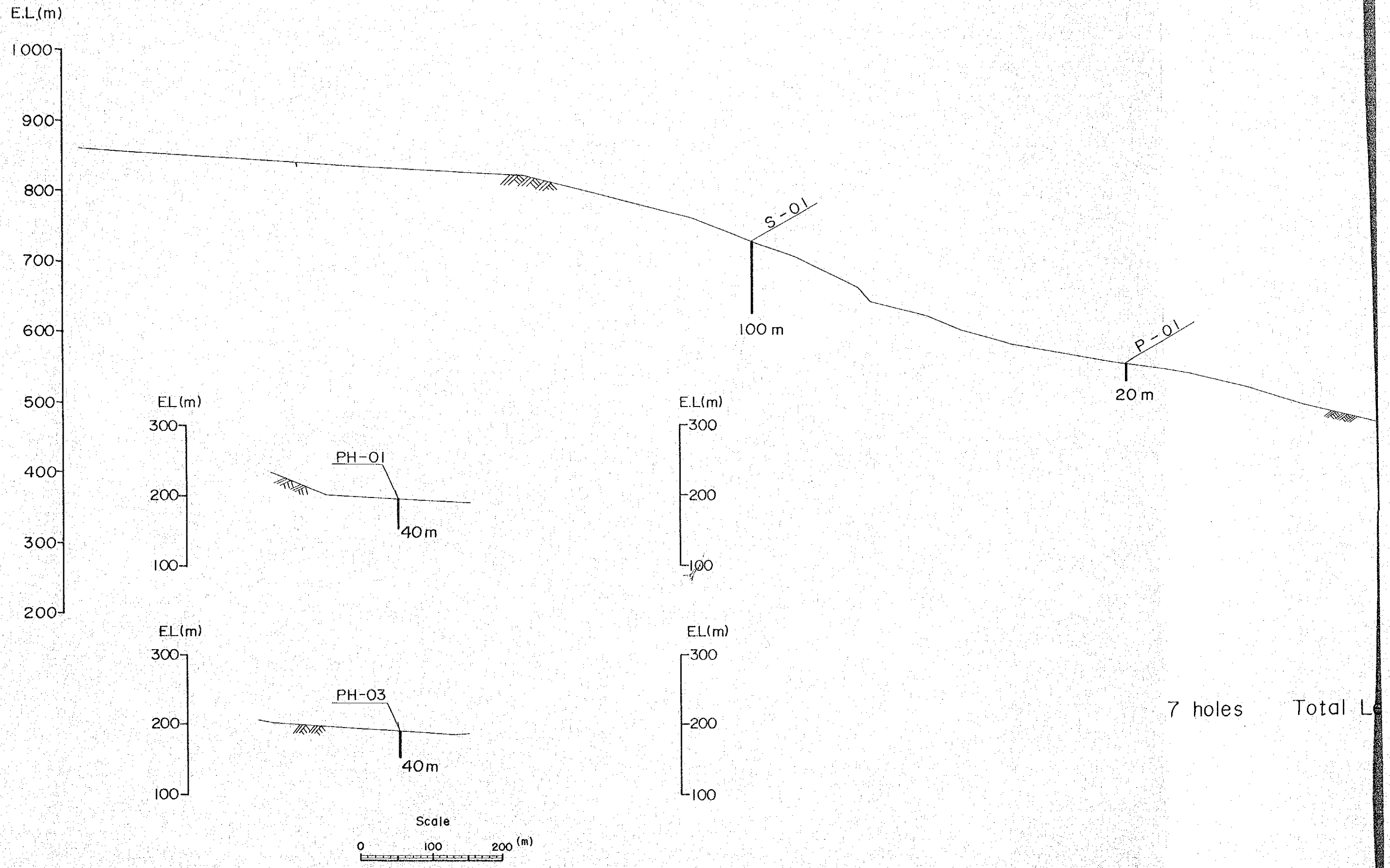


Legend

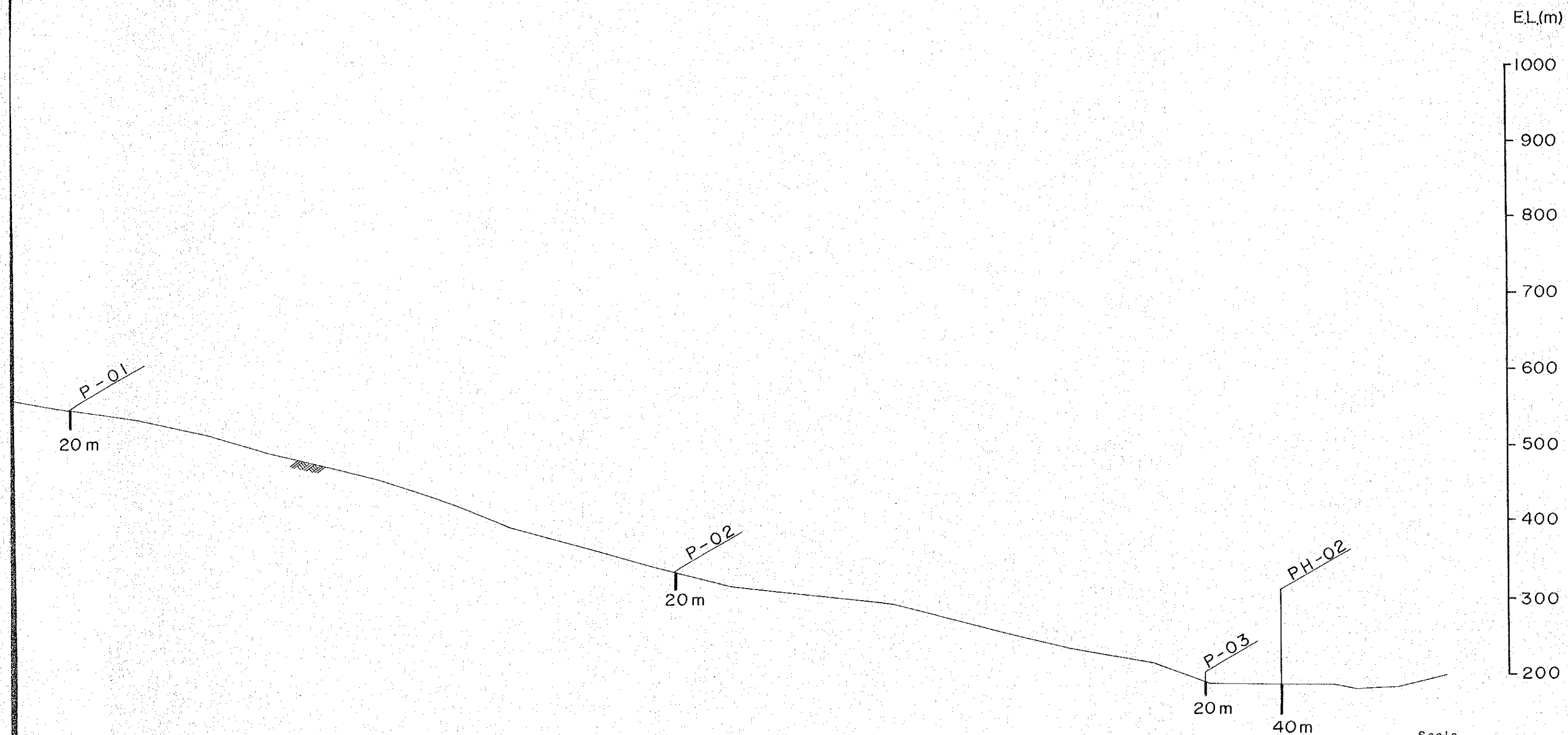
- : Drilling
- - - - : Seismic Prospecting

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 Plan of Geological Investigations
 for Surgetank, Penstock Route
 and Powerhouse Sites
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Fig. 14-12 Section of Geological Investigations for Surgetank,



Locations for Surgetank, Penstock Route and Powerhouse Sites

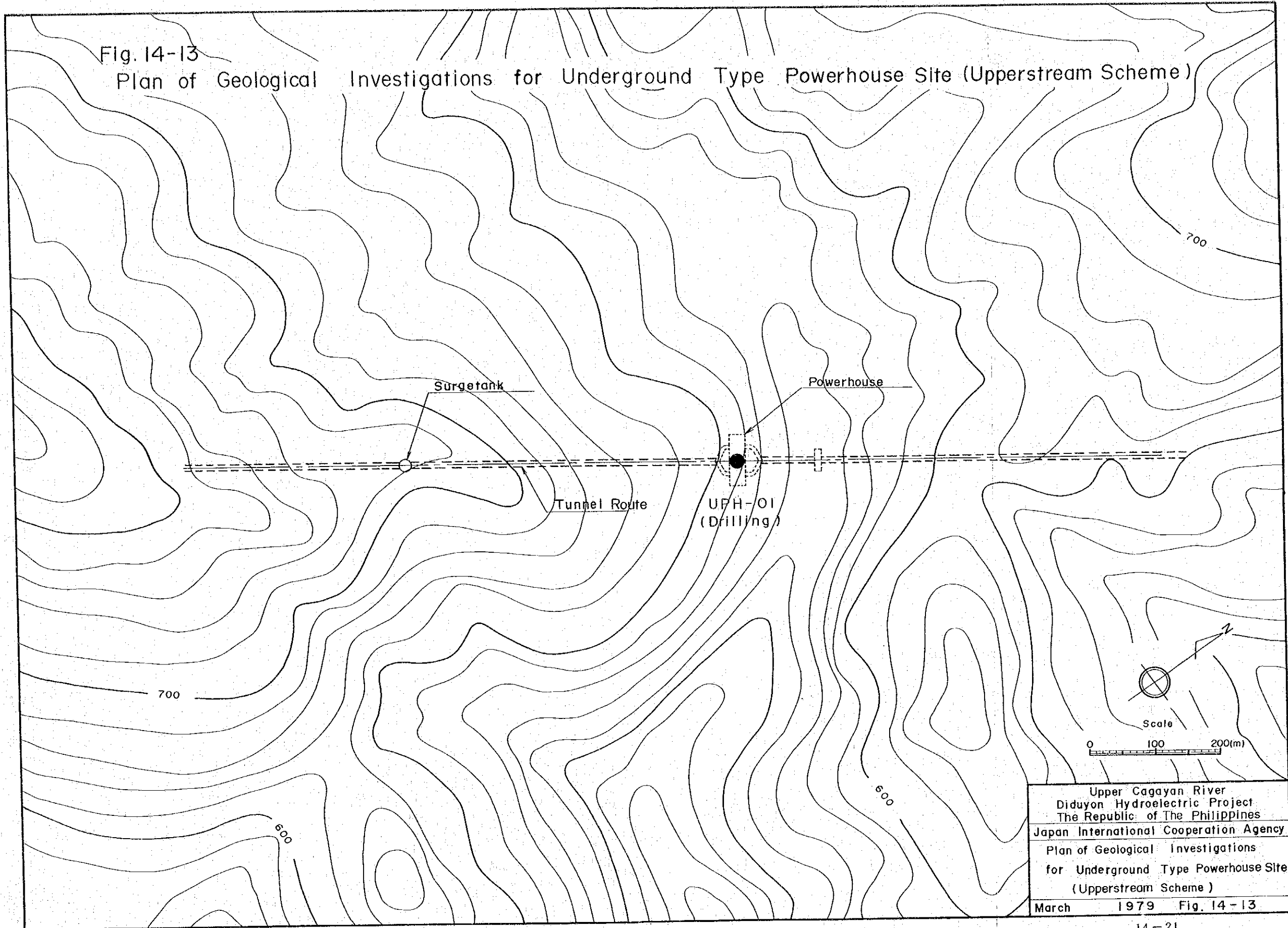


7 holes Total Length = 280 m

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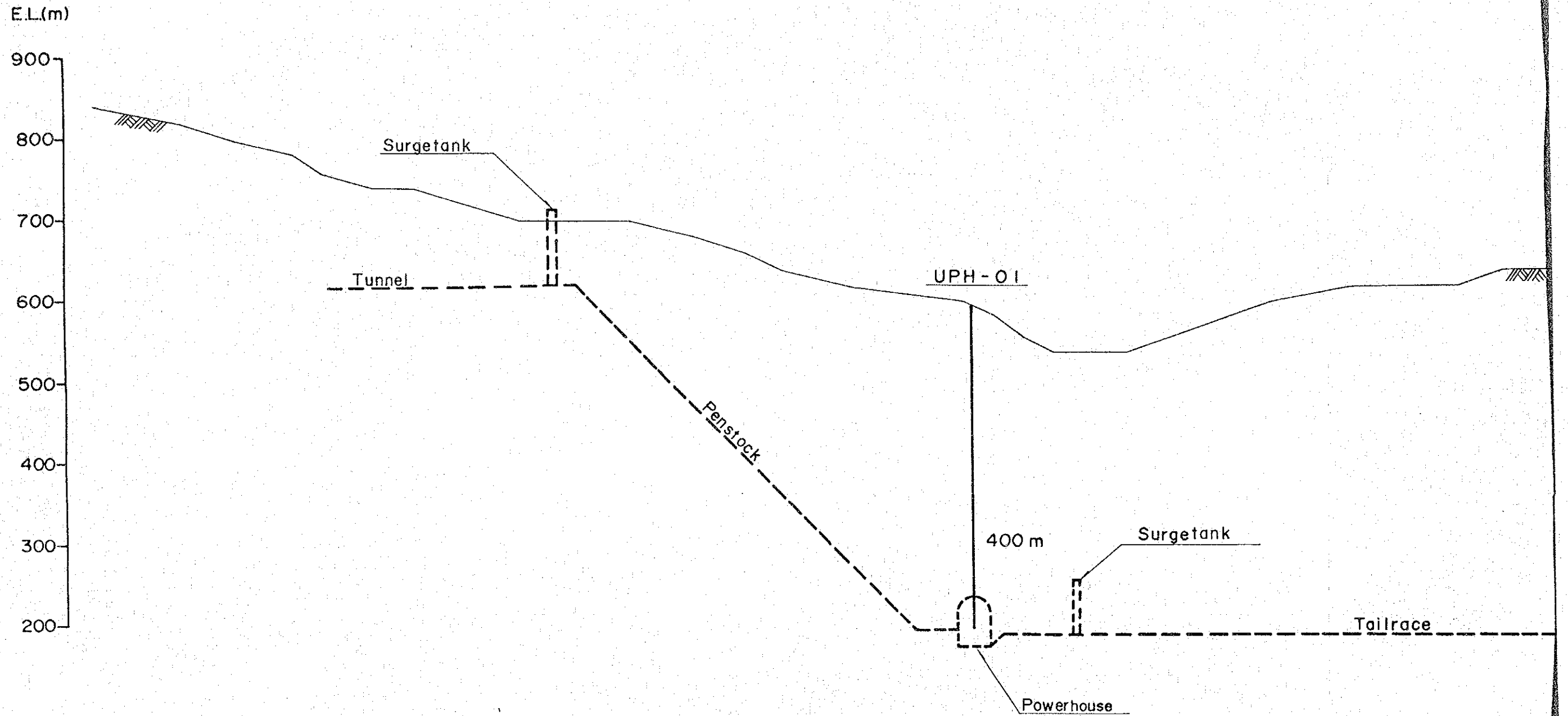
Fig. 14-13

Plan of Geological Investigations for Underground Type Powerhouse Site (Upperstream Scheme)

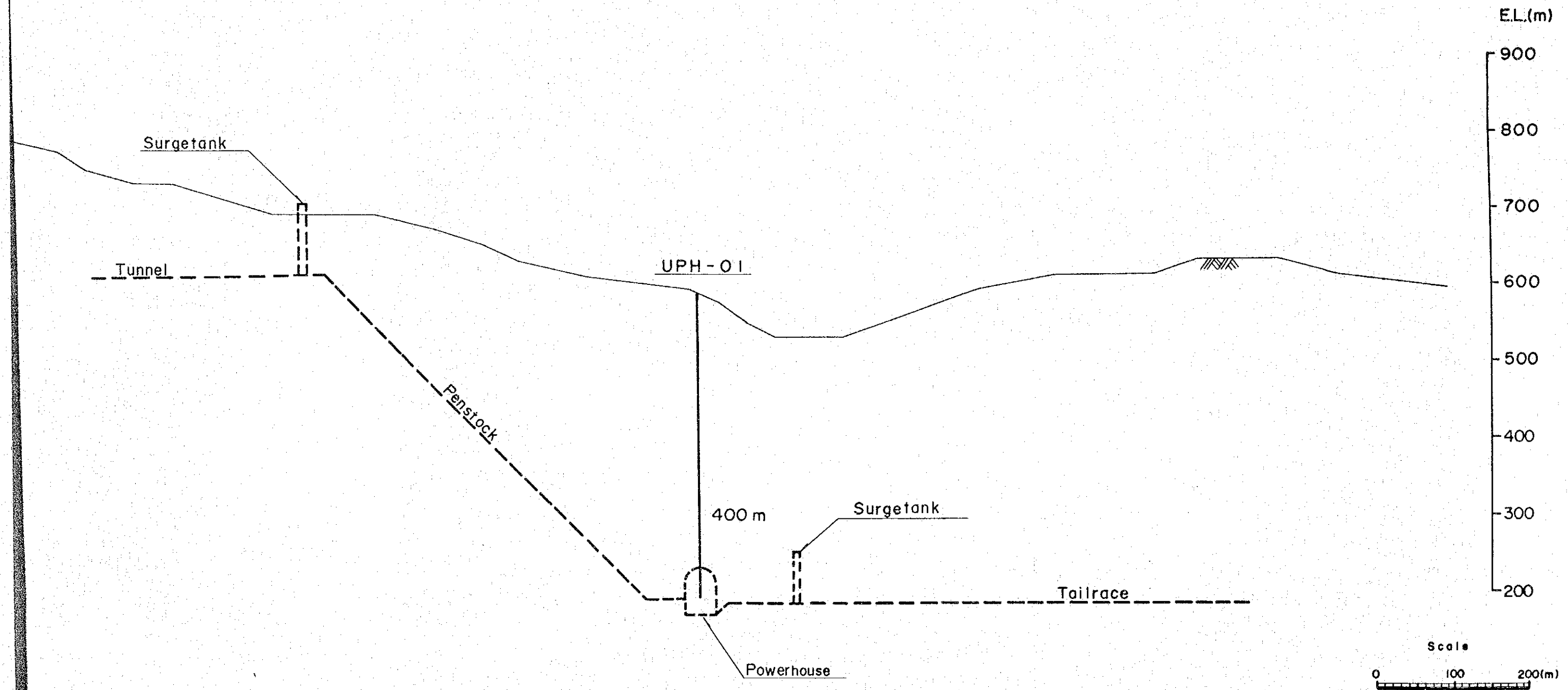


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Plan of Geological Investigations
for Underground Type Powerhouse Site
(Upperstream Scheme)
March 1979 Fig. 14-13

Fig. 14-14 Section of Geological Investigations for Underground Type Powerhouse Site (Upperstr

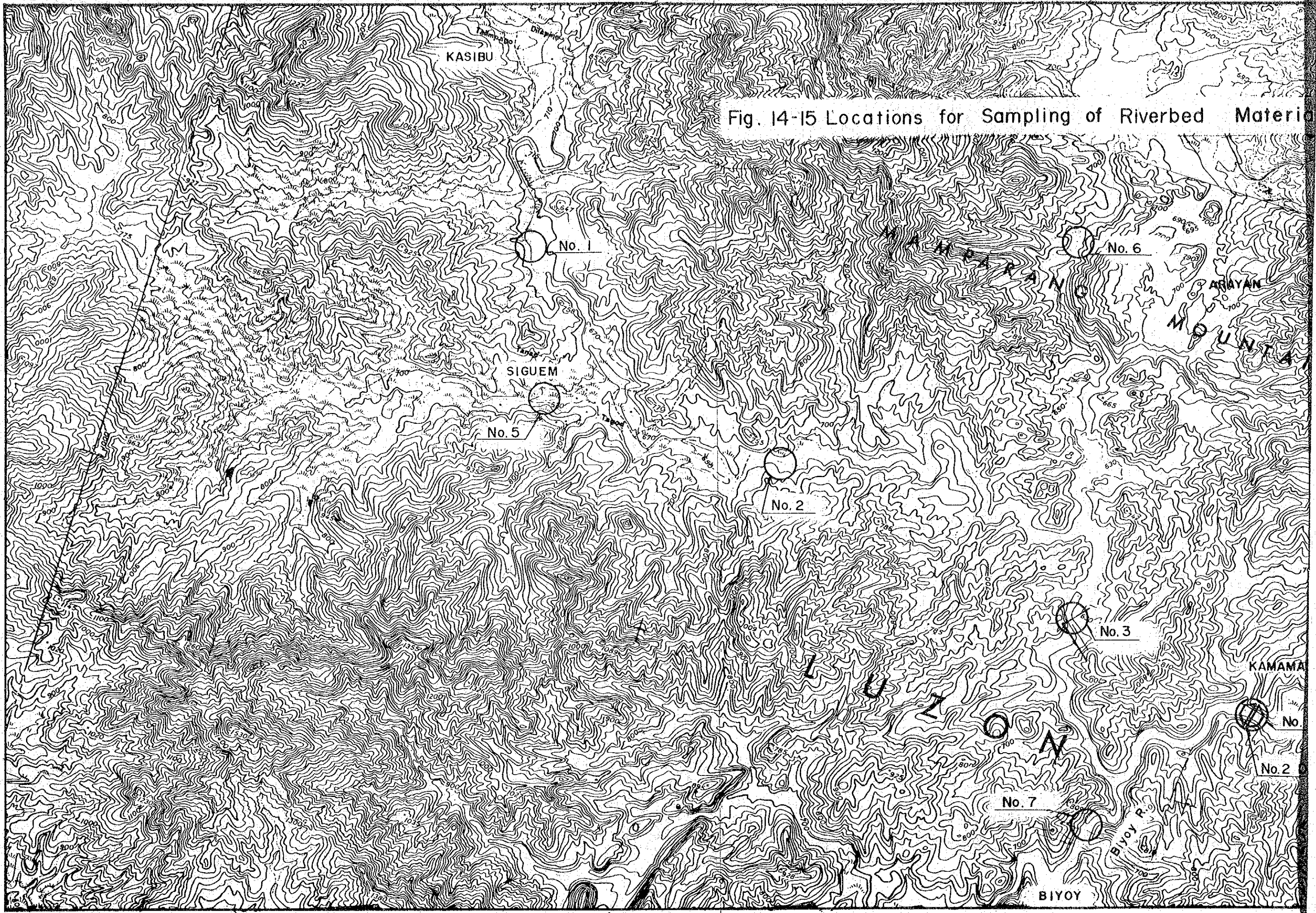


14 Section of Geological Investigations for Underground Type Powerhouse Site (Upperstream Scheme)

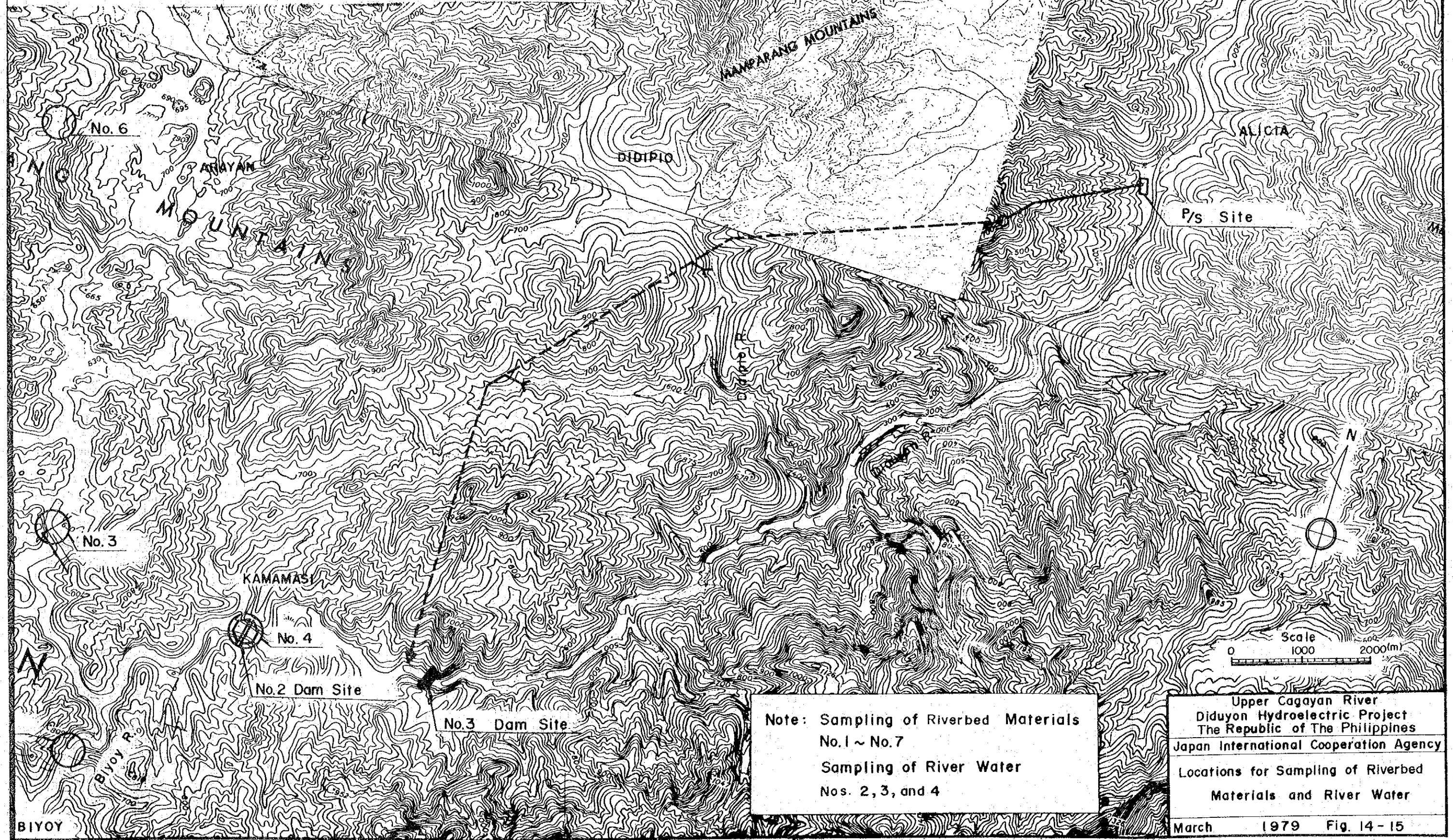


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Section of Geological Investigations for Underground Type Powerhouse Site (Upperstream Scheme)
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Fig. 14-15 Locations for Sampling of Riverbed Material



Sampling of Riverbed Materials and River Water



Note: Sampling of Riverbed Materials
 No.1 ~ No.7
 Sampling of River Water
 Nos. 2, 3, and 4

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 Locations for Sampling of Riverbed
 Materials and River Water
 March 1979 Fig. 14-15

15. Progress and Time Schedule of the Study

15.1. Field Investigations

a) Time Schedule of Field Investigations

A large scale typhoon attacked Luzon Island in October, 1979. The project area was also damaged by the typhoon; the roads were heavily damaged, many bridges were washed away, many wooden culverts were also washed away, and the village roads and logging roads were damaged in many places. The progress of the field investigations was affected badly by the damage caused by the typhoon.

In January 17, 1979 in Manila, the time schedule of the field investigations were discussed between NAPOCOR and the JICA Study Team, considering the conditions of the project area affected by the typhoon, and both parties agreed on the time schedule as per Tables 15-1, 15-2 and 15-3.

b) Progress of Field Investigations up to March, 1979

- i) The surveys of the datum points which provide a base for the all proposed surveys have been completed. The surveys of the locations for the geologic explorations have also been completed.
- ii) The seismic prospecting of the No.2 Dam Site has been finished.
- iii) One set of drilling machine is made available at the No.3 Dam Site. The other sets of drilling machines are being brought into the project site one after another.
- iv) As far as the test aditting concerns, application is submitted by NAPOCOR for the governmental permission to use explosives on the site.

- v) The specimens of the core materials and the fine aggregate materials were collected on the site and were sent to Manila for the laboratory tests. The physical tests of the specimens were almost finished, and the dynamic tests are now in progress.
- vi) Hydrologic observations are ongoing with the rain gauges and water level gauges installed in July, 1978 under the supervision of the JICA Study Team. The water level gauge installed at the dam site was broken by the typhoon which attacked the Philippines in October, 1979 and is now under repairs.

15.2. Overall Schedule of the Study

The overall schedule of the study was reviewed on the basis of the progress and prospect of the field investigations on the site as of the end of March, 1979. The revised schedule of the study is presented in Table 15-4.

Table 15-1 Tentative Time Schedule of Surveying Work

Working Item	Month	1979							
		1	2	3	4	5	6	7	8
A. Topographic Maps									
1. Main structures sites 1/5000		=====							
2. Main structures sites 1/1000			=====						
3. Whole project area 1/10000			=====						
4. Control point surveys		=====							
B. Ground Survey (Longitudinal and Cross-section)									
1. Reservoir area 5 lines			=====						
2. Dam axis 6 lines						=====			
3. Dam site and vicinity 3 km					=====				
4. Powerhouse site and vicinity 3 km				=====					
C. Location Survey									
1. Seismic prospecting lines		=====							
2. Test adit sites		=====		=====		=====			
3. Drill holes		=====							
4. Material sampling sites						=====			

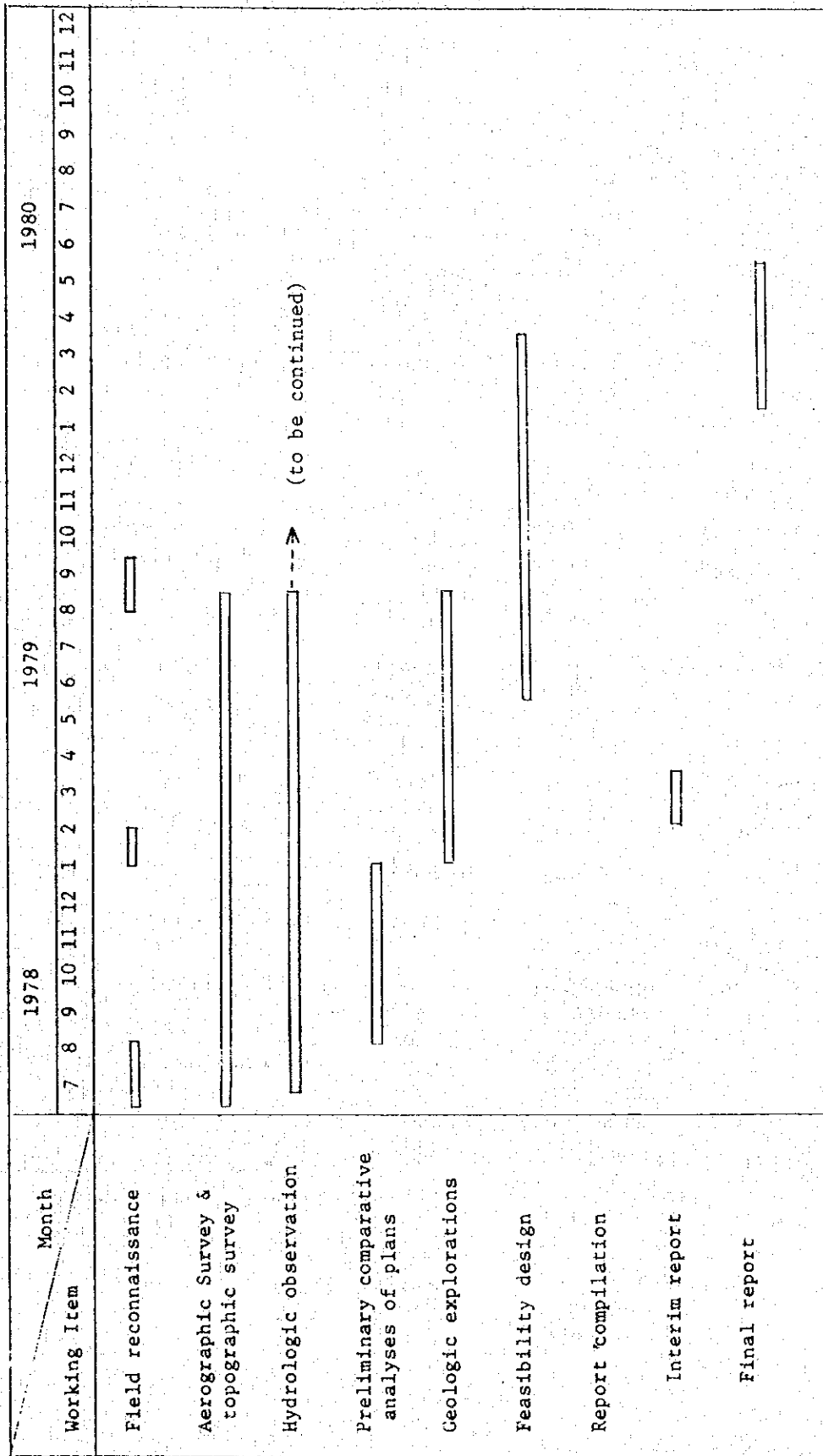
Table 15-2 Tentative Time Schedule of Drilling Work

Site	Hole No.	Length (m)	1979								
			1	2	3	4	5	6	7	8	
No. 3 Dam	DL-01	50									
	DL-02	50									
	DL-03	50									
	DL-04	100									
	DR-01	50									
	DR-02	50									
	DR-03	50									
	DR-04	100									
	DR-05	70									
	DR-06	100									
	DR-07	70									
	DR-08	70									
DR-09	70										
No. 2 Dam	D ₂ L-01	40									
	D ₂ R-01	60									
	D ₂ R-02	40									
Headrace Tunnel Adit	T-01	40									
	T-02	40									
	T-03	40									
	T-04	40									
Surge Tank	S-01	100									
Penstock Route	P-01	20									
	P-02	20									
	P-03	20									
Powerhouse (open)	PH-01	40									
	PH-02	40									
	PH-03	40									
Powerhouse (Underground)	UPH-01	400									
Aggregate Quarry site	A-01	50									
	A-02	50									
	A-03	50									
	A-04	50									
	A-05	50									
Total	33 holes	2,110 m									

Table 15-3 Tentative Time Schedule of Seismic
Prospecting and Test Aditting

Working Item		Month	1979							
			1	2	3	4	5	6	7	8
<u>Seismic Prospecting Work</u>										
<u>Site</u>	<u>Line No.</u>	<u>(m) Length</u>								
No.3 Dam	D-S-01	1,000								
	D-S-02	400								
	D-S-03	400								
	D-S-04	400								
No.2 Dam	D ₂ -S-01	1,000								
Headrace Tunnel	T-S-01	400								
	T-S-02	400								
Surge Tank	S-S-01	300								
Penstock Route	P-S-01	2,500								
	P-S-02	500								
	P-S-03	400								
Powerhouse	PH-S-01	400								
	PH-S-02	400								
	PH-S-03	300								
	PH-S-04	300								
Aggregate Quarry site	A-S-01	400								
	A-S-02	400								
Total	18 lines	10,000								
<u>Test Aditting Work</u>										
No.3 Dam	DL-680-01	50								
	DL-640-02	50								
	DL-600-03	50								
	DR-680-01	50								
	DR-640-02	50								
	DR-600-03	50								
Total	6 adits	300								

Table 15-4 Overall Schedule of the Study



JICA